

## KEYNOTE ADDRESS – Day 2

### GOOD NEWS, BAD NEWS:

#### GRADUATE STUDIES AND RESEARCH IN THE CANADIAN CONTEXT

Martha Crago

President, Canadian Association of Graduate Studies and  
Dean of Graduate and Postdoctoral Studies, McGill University

This paper focuses on several of the essential elements in the link between graduate/postdoctoral studies and research. It includes questions and issues related to the funding of research and of graduate students, the retention and graduation rates of graduate students, innovations in graduate programs, the need for professional skill training and education on the responsible conduct of research, the place of postdoctoral fellows in our university, and the importance of the full spectrum of science and humanities research and scholarship.

#### *Increased Federal Support for Graduate Studies and Research*

There has been considerable good news for research and graduate studies in Canada over the last five years. Most importantly, they figure very squarely in the national agenda. For the last six years the government invested substantial sums of money in higher education and research. The Canada Foundation for Innovation was created to provide competitive funding for the re-equipping of university research facilities. The Canada Research Chairs, a program designed to provide salary enhancements that would bring outstanding researchers into our universities, was the next federal initiative. The allocation of these Chairs is based on the relative size of the operating research grants in each university.

In light of these innovative investments, at the 2001 annual conference of the Canadian Association for Graduate Studies, we explained to the representatives of the governments of Canada and Quebec the essential nature of graduate education in the scientific, social and cultural development of our nation. At this time the Quebec and Canadian government officials were confronted with what is now referred to as the “Godmother’s Promise,” that is, an offer that the governments could not refuse. I promised on behalf of the Canadian Deans of Graduate Studies that our universities would produce well run, cutting edge graduate programs, highly skilled personnel, and timely and high graduation rates in return for increased funding for graduate students. However, in that year’s budget graduate students were left out of the federal funding initiatives, taking a back seat to increased spending on national security.

Last year, the Canadian federal government announced a strategy for innovation aimed at moving Canada from 15<sup>th</sup> to 5<sup>th</sup> in the world in research and development. This strategy emphasized the importance of highly qualified personnel in research and development—in other words, people with graduate degrees. The retirement bulge in Canadian universities has meant that large numbers of people with doctoral degrees will be needed in our universities. Half of these positions will be in the humanities and social sciences. The prediction is that, overall, 80,000 more people with graduate degrees will be needed in Canada by the year 2011. This is approximately twice as many as our universities would normally graduate in that time period. In line with these predictions, the 2003 federal budget announced the creation of the latest of their educational investments: the Canada Graduate Scholarships. These scholarships provide \$35,000 per year to doctoral students for three years and \$17,500 to master's research students for one year. In addition, the Quebec government provided full tax exemption on all merit based graduate scholarships, including money paid to graduate students from research grants.

So what could possibly be the bad news?

Having received the good funding news, Canadian Deans of Graduate Studies are now asking themselves if the scholarships are too big and their duration too short. At \$35,000 doctoral funding is now equal in size to the national research councils' postdoctoral fellowships. This has made many postdocs uncomfortable and put pressure on professors to increase postdoctoral funding from their own research grants. Furthermore, is it realistic to think that most doctoral students will complete their degrees in three years? It would have made better sense if the government had consulted more broadly on their plans for these scholarships.

#### *More Bad News: Times to Degree and Graduation Rates*

In response to the need for more graduates, a number of Canadian universities became aware that there are real limits on the space they have for increased admissions of graduate students. Consequently, attention has been given to two other alternatives for graduating larger numbers of graduate students: higher graduation rates and faster times to completion. Faced with this realization and remembering the bold offer to the government, the top research intensive universities in Canada, somewhat belatedly, decided to investigate what the actual times to degree and graduation rates of their graduate students really were.

The 1992 cross-university cohort study of all doctoral and research master's students was not simple to design. Ten universities had to agree on definitions and how to count their students. This, alone, took two years. The study investigated three factors associated with retention: graduation rates, time

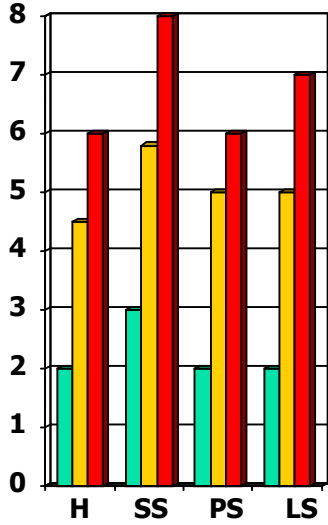
to completion, and time to withdrawal or leaving. In short, the findings of the study were not good news (Berkowitz, 2003).

**Graduation Rates.** As the following graphs reveal the percent of students graduated varies from one university's low of 46% of their humanities master's students to a high of 91% of the master's students in another university's life science programs. The minimum master's level graduation rates across the disciplines varied widely. At the doctoral level the university with the lowest graduation rate was one that only graduated 34% of its doctoral students in humanities after 10 years. Overall, the graduation rates in the humanities were the lowest. The social sciences had higher rates and the physical sciences were even more successful with the median university graduating 70% of its students. The life sciences graduated the most students. The minimum graduation rates, particularly in the humanities and social sciences, were alarmingly low, especially considering the national need to graduate highly qualified personnel in all disciplines.

**Times to Completion.** The times to completion were not good news either. Measured in semesters (NB: a number of Canadian universities only register their graduate students two semesters in the year), at both the master's and doctoral level, median times to completion were higher in the humanities and social sciences than in physical and life sciences. In a humoristic comparison with the 8 deans of graduate studies who sit on the Executive Committee of the Canadian Association of Graduate Studies, I noted that across the disciplines our times to completion were lower than the 1992 cohort. Are deans outliers or have things gotten worse? Data from the Council of Graduate Schools confirm that times to completion in the United States have become longer over the last decade.

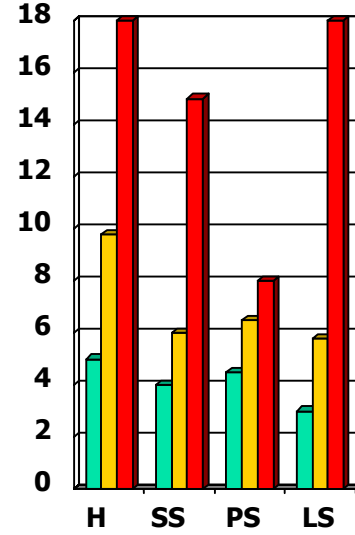
**Times to Withdrawal.** Finally, the time it took students to leave their university, either from free or forced choice, were investigated. The shocking thing about these results is that the times it took for students to leave a university were nearly the same as the times to completion. At some universities students were leaving after 8 semesters at the master's level and after 18 semesters at the doctoral level. Previous work by Nerad and Miller (1996) has indicated that there are two patterns of leavers. Some decide for good reasons to leave earlier than late leavers who appear to run out of steam or money after as many as 8 or more years of studying. Note the two graphs with smoothed curves depicting one university with more early leavers and another with more late leavers. The personal and institutional expense of graduate students leaving without a degree after more than 8 years of study is truly an educational tragedy.

### Masters

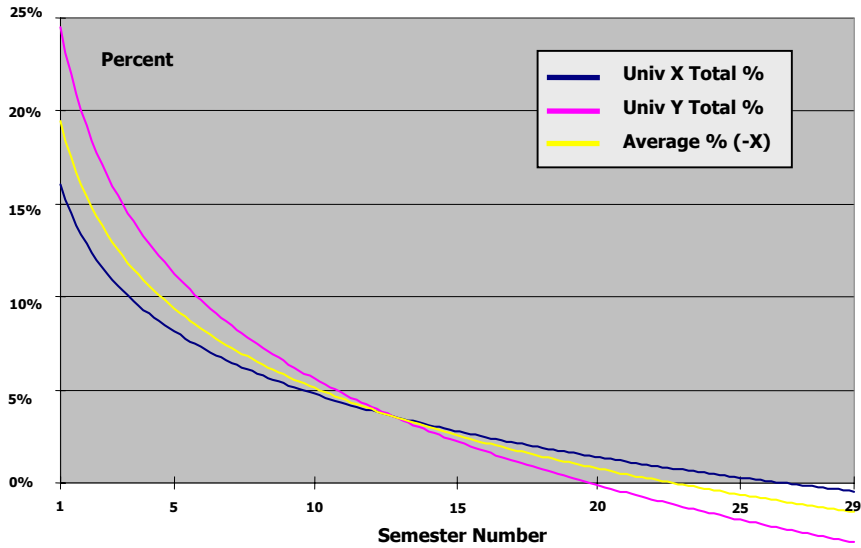


- SS=Social Science
- PS=Physical Science & Engineering
- LS=Life Science
- H=Humanities

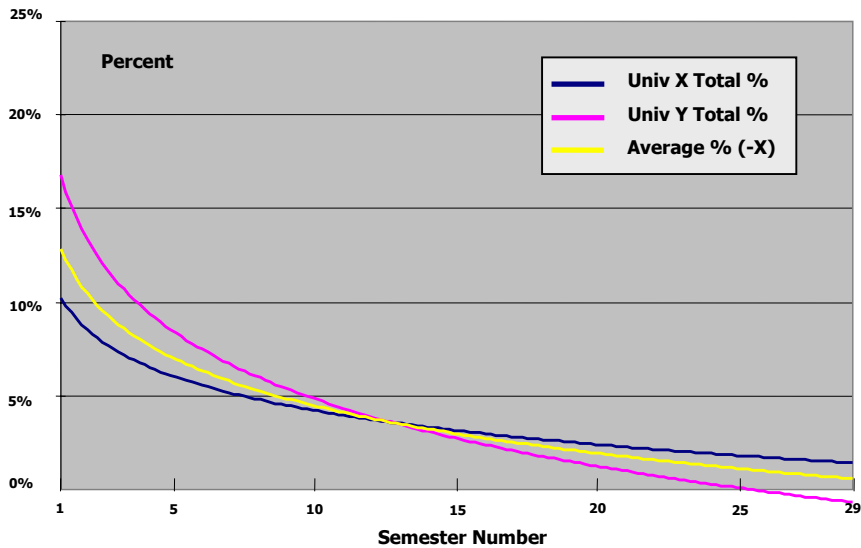
### Ph.D.s



### Master's – Percent of Total Leavers



### Doctoral – Percent of Total Leavers



## *Factors Affecting Retention*

A number of recent studies have pointed to important factors that affect doctoral attrition (Golde, 200; Lovitts, 2001). Among these factors are graduate student funding, program design, academic participation, quality admissions and advising and progress tracking. The identification of these factors is helpful but many questions remain about what universities can actually do to improve retention rates.

There are questions about funding mechanisms, such as, what forms, rates and duration of funding will have the most impact on graduate retention. There are also questions about what form of program design will have the most positive impact on learning as well as on retention. We are still not certain how much course work is necessary nor how extensive a thesis should be. Have we raised the bar too high when we expect master's students to have publications and doctoral students to have even more of them? Canadian universities need to consider whether the research master's degree needs to be the typical entry requirement for the Ph.D. Universities will need to question the impact of new multidisciplinary programs on time to completion and how best to structure such programs. How should such programs be fitted into our present administrative frameworks? How can we be sure they create both disciplinary and multidisciplinary strength? What will motivate them? Will it be research clusters or funding opportunities?

If participation in a group positively influences retention, then funding agencies need to investigate the impact of graduate student funding mechanisms, such as training grants, that support involvement with others. New modalities will be needed for involving graduate students in the humanities in activities with other graduate students and researchers. In addition, mechanisms for setting objectives and tracking progress to degree need to be transparent and widely used. Advisors and administrators need to counsel certain students to withdraw earlier rather than later if they appear to be ill-suited to research and scholarship. Universities need to consider failing students for documented lack of research progress. Finally, issues of time to completion raise questions about the postdoctoral experience. Will shorter times to completion of a doctoral degree necessarily imply a postdoctoral experience? Will a postdoctoral scholar/scientist cost more than a graduate student? In the end will the time from the start of a degree to the start of employment be the same? These are all crucial questions for which we need good data.

## *Other Essential Elements in Graduate Studies*

**Professional Skill Training.** More and more students and their universities are finding that it is an important part of graduate education to provide students with professional skill training over and above what they learn from their supervisors. They need the skills to present their research to various

audiences, both in presentation and publication format. Graduate students and postdocs need to learn about and participate in research grant writing. Universities need to help graduate students find jobs both inside and outside of academia. This involves learning about the full range of employment possibilities as well as how to prepare a curriculum vita and interview for a job. The development of these career related skills implies the need for universities to provide graduate career counseling services.

**Intellectual Property Rights and the Responsible Conduct of Research.** Graduate students in Canada are actively concerned with their intellectual property rights all the way from the meaning of the copyright on their thesis to the marketing and proprietorship of a patent or the authorship of a journal article. In a time when universities are seeking out and developing research partnerships with non-university research partners, we need formal agreements that make explicit and transparent the rights and responsibilities of the student, the university supervisor and the non-university partner. Students need easy to understand guidebooks that explain their universities' intellectual property policies to them. Questions need to be raised about the meaning of non-disclosure agreements and their impact on students being able to share their findings with others, in publications and in university seminars. Should students be paid by their supervisors' spin-off companies? Can students use equipment in their supervisors' spin off company? Moreover, our students need to be taught explicitly about the responsible conduct of research. Students in professional degree programs take courses in professional ethics. Does your university offer courses in research ethics or a section of a research methodology course on human subjects' research and conflicts of interest? Mine does not.

**The Postdoctoral Experience.** There has been a recent growing interest in the postdoctoral experience. This interest has spawned a set of questions. Who will administer these important but often forgotten people on our campuses? How do we admit them? Is there a need for quality standards? Should they have to obtain, for example, a certain score on a TOEFL test? Are they paid a salary or a fellowship? Does this imply benefits or not? What are appropriate benefits? Is the postdoctoral experience a research internship or a job? Legal precedent in Quebec has determined that the postdoctoral experience is a research internship and not an employment category. If it is a research internship, then what are our educational responsibilities for postdocs?

**Full Spectrum Science/Scholarship.** In an exciting lecture sponsored by the Killam Trust at the 2002 Canadian Association for Graduate Studies conference, President Martha Piper from the University of British Columbia presented a rousing wake-up call to Canadian politicians and Deans of Graduate Studies concerning the importance of the humanities and social sciences in today's world. She cited evidence that cities with rich cultural communities and diverse populations are more successful in research and development. She reminded us that Canada, and I believe this could be extended to the United

States as well, have crucial roles to play in fostering the understanding of human culture and behavior. This understanding may well become the most important component of a global research and development agenda. Put succinctly, our graduates can invent all the widgets possible but if we cannot learn to live together peacefully these inventions may end up serving no purpose. One exciting outcome of Dr. Piper's lecture was the disproportionately high numbers of Canada Graduate Scholarships allocated to students in the social sciences and humanities.

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### *Some Final Links*

In closing, I will mention three important links for us to consider.

First, it is important that university research and graduate studies administrators keep active links with each other and with their granting councils and governmental contacts.

Second, we need to foster the links and communication between humanities scholars, social scientists, physical scientists and life scientists. This world has many facets and educated citizens need to be aware of its multiple aspects.

Finally, this world also has many different countries and populations. We need to foster links between them so that we and our students can develop an understanding of multiple and diverse contexts for the creation of knowledge.

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