Canadian Association for Graduate Studies

Association canadienne pour les études supérieures

A Research and Innovation Plan

Pre-Budget Submission to the House of Commons Standing Committee on Finance Regarding the 2011 Federal Budget

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The Canadian Association for Graduate Studies (CAGS) is a national organization of 60 institutions engaged in graduate education and research in all academic disciplines. It includes the graduate student associations that together represent 165,000 graduate students. It is dedicated to the advancement of higher education and university research.

A Research and Innovation Plan for Long-Term Economic and Social Development

The present and future of research and innovation in Canada hinges on graduate students and consequently graduate education must be appreciated as being a vital component of the Canadian education system and must be strengthened as part of a federal strategy on research and innovation.

Our institutions of higher education are our most important basic-research engine. In 2007, 26% of researchers in Canada were employed by universities[1]. Canada ranks first in the G7 countries for research and development, (R&D), performed in the advanced education sector as a percentage of the Gross Domestic Product, (GDP)[2]. Graduate education is the core of academic research. Graduate schools train the scientists, analysts, engineers, and other experts in a wide range of disciplines that are crucial to the competitiveness and prosperity of Canada in the 21st century. President Obama rightly noted: *The nation that out educates us will out compete us[3].*

The Federal Government has undertaken a number of important funding initiatives, notably the Canada Graduate Scholarships and the Vanier Scholarships and most recently the Banting Postdoctoral Fellowships, which have collectively enabled some of the brightest minds in Canada and from abroad to attend Canadian universities and participate in the research enterprise. To build on those foundations, however, requires investment to ensure the quality of their experience so that these young researchers can reach their potential. This can be best achieved by providing funding for the environments in which they will be working, the scholars with whom they will collaborate, and the resources needed to bring their research to fruition. Over the last twenty years, as noted by the economist Richard Florida[4], the structure of the economy has shifted from an industrial to an **idea** driven economy favouring more educated and academically skilled workers. More and more, economic growth is based not on producing things, but rather on producing ideas. Workers are now asked to think, rather than produce, i.e. to come up with new or better ways of doing things. The success of an economy, as convincingly argued by economists Arnold Kling and Nick Schulz, depends on how quickly it can be invested by new ideas[5]. Many of these ideas originate in graduate education.

But just as the structure of the economy has been transformed, so too has the structure of graduate education, mainly because of global trends. Triggered in part by the reimagining and restructuring of post-secondary education in Europe associated with the Bologna Accords, fueled by the expansion and diversification of university education in Asia, and rooted in the increasingly border-less flow of ideas and individuals, Canadian and American universities are under growing pressures to rethink graduate education so as to enable our programs and our students to participate effectively within what is simultaneously a highly competitive and a potentially collaborative global knowledge economy. As one British commentator recently observed, “Asian higher education is on the rise in a success story that is shaking up the global order.”[6] Ben Wildavsky’s 2010 study of gobal trends substantiates these concerns. For example,

from 1999 to 2009, the number of students attending a university outside their home countries rose by 57 per cent to 3 million; there has been a doubling of cross-border scientific collaboration (measured by co-authored journal articles) since 1990; and half of the world's top physicists no longer work in their home countries.[7] It is within this context of competition and collaboration that Canada must frame its innovation strategy

Governments across the country agree that we need to be more innovative than we have been, if only to deal with our well-known and long standing "productivity malaise"[8], and/or our "innovation underperformance"[9], and also to address many of the social, environmental, and political challenges which lie before us. A highly trained workforce is key to innovation, entrepreneurship, and research and development. Masters and doctoral graduates are highly employable; they are more likely to enter professional and managerial positions and they, on average, earn more than high school and college graduates. There is escalating demand for advanced education. For example, it is estimated that more than half of the new jobs projected over the next ten years in the U.S.A. will be in professional and service occupations in the private, public and the non for profit sectors[10], and many of these jobs will require masters degrees. The situation will likely be the same in Canada.

There are, therefore, several things the federal government can do to stimulate and sustain research and innovation in order to promote long-term economic and social development: 1] invest in the federal research-granting councils, 2] invest in graduate student mobility, 3] invest in innovative skills training for graduate and postdoctoral researchers, and 4] invest in postdoctoral scholars.

1. Invest in the federal research-granting councils

The government of Canada plays a critical role in supporting university research and graduate education through its three research-granting councils: the Canadian Institutes of Health Research, (CIHR); the Natural Sciences and Engineering Research Council of Canada, (NSERC); and the Social Sciences and Humanities Research Council of Canada (SSHRC). Recent substantial investments by the Government of Canada in prestigious scholarships and fellowships for graduate and postdoctoral researchers has assisted us to identify and support individual excellence and has helped us to compete for promising talent, whether Canadian or from abroad. Equally important however to the research enterprise is to ensure that these students and postdoctoral fellows are able to work within an environment that will sustain and inspire them intellectually. For that, we need to provide them with the libraries and laboratories necessary for their research, as well as assure them of opportunities to participate in research projects overseen by well supported and highly motivated faculty. Significantly, the recently-launched Banting Postdoctoral Fellowship Program acknowledges this crucial link between the quality of the personnel and the quality of the research environment.

As recognized by the OECD, strong basic research is a cornerstone of our success and over time it will make a real difference in our lives.[11] Most research funding increases to the federal research-granting councils in the last three years have been to targeted

government priorities. While strategic targeting may be necessary to address pressing problems, over targeting of research reduces our capacity to produce the basic research upon which future innovation is built and constrains our ability to respond quickly to unforeseen or newly emerging research questions. Participation in basic research will contribute to educating and training thousands of graduate students who will choose to enter the workforce not only in academic research but as highly skilled workers in diverse industries.

The government's approach to funding for research should be balanced, including both basic and targeted research. We urge that the majority of new funding to the federal research-granting councils be directed toward fundamental research so as to help restore the balance. Indeed, your own Committee reported in November 2009 that *the government should increase its support to research through federal granting councils and research agencies as well as for indirect costs of research*[12].

Therefore, adequate financial support to the research granting councils is critical. The European Union's Barcelona Target is to invest 3% of its GDP in R&D, 2% coming from the private sector and 1% from the public sector[13]. Our country should also aim to spend 3% of its GDP in R&D. It has a long way to go however; in 2009 it spent 1.95% of its GDP in R&D[14], 54% came from the private sector, 35% from the higher education sector, 10% from the government sector and 1% from the not for profit sector.

2. Invest in graduate students' mobility.

Advanced education is an increasingly global market as students become more mobile and more willing to look beyond their national boundaries. In 2007, 2.8 million students were enrolled in higher education institutions outside their country, which represents a 53% increase since 1999[15]. Indeed, higher education institutions are among the most globally connected institutions in the world.

The proportion of international graduate students in Canada has steadily increased in the past decade going from 11.1% of graduate students in 1996 to 14.7% in 2006[16]. But we are lagging behind the other major international players, and there are signs that we will soon be competing with universities in Asia, especially Japan, India, Korea and China. International students in tertiary education are highly concentrated in a few countries. Two-thirds of them are studying in only seven destination countries, and Canada ranks 6th of these countries (after the U.S.A., U.K., Germany, France and Australia) with 5.1% of international students[17]. These international students make an important contribution to Canadian higher education and society; they bring diversity to our universities and to our country. They are a prime source of immigrants: they are well-educated, familiar with the language and culture, and are already recognized as a valuable resource by the private sector. Those who return to their home countries become leaders there and maintain good connections with Canada. We should definitely strive to increase their numbers.

The competition for top graduate students worldwide is very stiff, as other advanced and emerging countries are developing and marketing their own graduate education systems. Under such conditions, we need to do more to attract the very best graduates from around the world. The universities' reputation, the availability of scholarships and affordable fees are the main factors attracting mobile international students to a country. We welcomed the federal government's help in marketing Canadian universities abroad and the creation of the Vanier Scholarships which support some of the best research students to study in Canada. However, more should be done to strengthen and promote Canadian institutions of higher education on the international stage and we should examine ways of opening up more graduate scholarships to international students.

Relatively few Canadian students, in comparison with U.S. and European students, choose to pursue graduate studies abroad. We must urgently encourage and support more of our graduate students to pursue studies in other countries for their own development and to enhance the international reputation of our universities. Masters and doctoral students attending university on a Canada Graduate Scholarship (CGS) cannot use the funds to study abroad. We feel that this is short-sighted and unfortunate. We propose that recipients of Canada Graduate Scholarships be allowed to use their funds to study abroad.

The globalization of higher education can also be witnessed in the proliferation of collaborative degrees, with European countries being especially keen to promote them. Our universities as well as our students stand to gain from participating in such programs, and we urge the Research Councils to expand their ability to support students who wish to spend part of their time working outside Canada. The Michael Smith Foreign Student Supplements for which CGS and Vanier students are eligible is a welcome start in this direction, but we would encourage an expansion to the terms and eligibility for such awards so that more of our students could gain from this experience

3. Invest in innovative skills training for graduate students and postdoctoral fellows

The Government of Canada has articulated the need to strengthen Canada's people advantage so that Canada can attract and retain the highly skilled people needed to thrive in a knowledge-based economy and to make meaningful contributions to society, both nationally and internationally. Increasingly, funding agencies, universities, employers of highly qualified people, researchers, and graduates themselves recognize the importance of professional skills that complement their disciplinary expertise. At the same time, an increasing number of graduate students and postdoctoral fellows are pursuing careers outside academe: most of the graduates from our advanced programs are not employed in the academic sector, but work in research-intensive industries such as engineering, pharmaceutical, manufacturing, and aerospace. Their ability to pursue the increasingly diverse range of career paths before them would be greatly enhanced through greater attention to professional/transferrable skills.

To be competitive, graduate students increasingly need to engage in ongoing development of their skills in areas that complement their academic programs, enhance

their employability, and foster linkages with the private, public and not for profit sectors. The knowledge economy demands a high level of professional skills from all of its participants. Graduate students need the right knowledge and skills to get the most from their graduate experience and be successful afterwards. They require additional information and support mechanisms to meet their needs and to be more responsive to their employers' needs.

We need, through the funding councils, further professional and transferable skills investment in innovative programs that will provide wider skills training for graduate students in preparation for what employers need or may need in the future. The CREATE program which was recently launched by NSERC is an example of the kind of training program that will help outfit our students with the competencies that will enable them to thrive in an increasingly complex knowledge economy.

4. Invest in postdoctoral scholars

Research in Canada depends on the output of graduate students and postdoctoral fellows working in our institutions and with our industrial partners. Postdoctoral fellowships are temporary assignments designed to provide additional education and training in research for recent PhD graduates. Fellows work full-time under the supervision of a faculty member at their university or at one of its affiliated institutions participating in the research program of their supervisor or doing substantially independent research of their own. These young scientists have an opportunity to make an original contribution to their field and publish the results of their research, enhancing their chance of securing a more permanent faculty position in both teaching and research. They are funded by the federal granting councils (through their supervisor's research grant or fellowship), the provincial governments, the private sector or their university.

They are significant and valued members of the university research community. It is important for Canada to invest more directly in postdoctoral fellows to help universities compete more effectively for talent here and abroad.

The 2010 federal budget announcement of 140 new highly competitive postdoctoral fellowships has enhanced the profile of these researchers and is welcomed evidence of increased federal attention to the role they will play in the increasingly competitive global knowledge economy. Yet the treatment and status of postdoctoral fellows in Canada varies considerably between institutions and is not consistent with the investment that has been made in their higher education. Nor does their treatment to date do justice to the critical contributions they make to advancing research in Canada. Other countries have recognized the critical importance of postdoctoral scholars and initiated reforms and policies to create a more welcoming environment. Unless we consider similar reforms in Canada, we run a very real risk of lagging behind our competitors in the global search for talent. We recommend that the government of Canada increase the number of fellowships available through the federal granting councils to postdoctoral researchers.

We thank the House of Commons Standing Committee on Finance for its attention to this matter. Please contact me (fgsdean@yorkuca, T: 416 736 5329) if you need any further information.

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