



McGill

**Moving science and
innovation forward
through strategic
investments in talent**

*Submitted by McGill University to the House of
Commons Standing Committee on Finance*

August 2018

Recommendations

1. Continue to implement the recommendations of the Advisory Panel on Federal Support for Fundamental Science by allocating an additional \$140 million per year for graduate student fellowships and scholarships (phased in over four years).
2. Expand NSERC's Undergraduate Student Research Awards program to other granting councils.
3. Raise the floor of the Research Support Fund to a minimum of 25%.
4. Create a program to enhance the international mobility of Canadian students.

1 Introduction

McGill University commends the Government of Canada for launching the Federal Science Review in 2016 and making an historic investment in fundamental research and research infrastructure in Budget 2018. This includes \$1.22 Billion over five years in new funding to the Tri-Council, and stable funding for scientific research infrastructure through the Canada Foundation for Innovation of \$763M over 5 years.

In this submission, we encourage the Government to leverage these investments by by enhancing funding for scholarships and fellowships for graduate students and by expanding existing support for research experiences at the undergraduate level. Investing in talent is key given the challenges facing today's workforce and the need to equip our students with the right mix of skills in order to stay relevant in the future. Canada needs a well-calibrated research ecosystem, which includes adequate levels of support for both graduate and undergraduate students.

Greater investment in the full costs of research is also a priority for McGill University. Support for the indirect costs of research – which include commercialization services such as intellectual property management, technology transfer, and partnership development -- is essential for the research enterprise and critical to a healthy innovation ecosystem. Several independent experts have estimated that the costs to Canadian universities associated with research – referred to as indirect costs – stand at between 40% and 60% of the direct costs of research. However, because of the way the Research Support Fund is designed, universities that conduct the most research have large funding shortfalls for indirect costs. This has real consequences for our innovation ecosystem and capacity to transform the results of our scientific research into innovative products, processes and services.

2 Increasing the number of graduate students

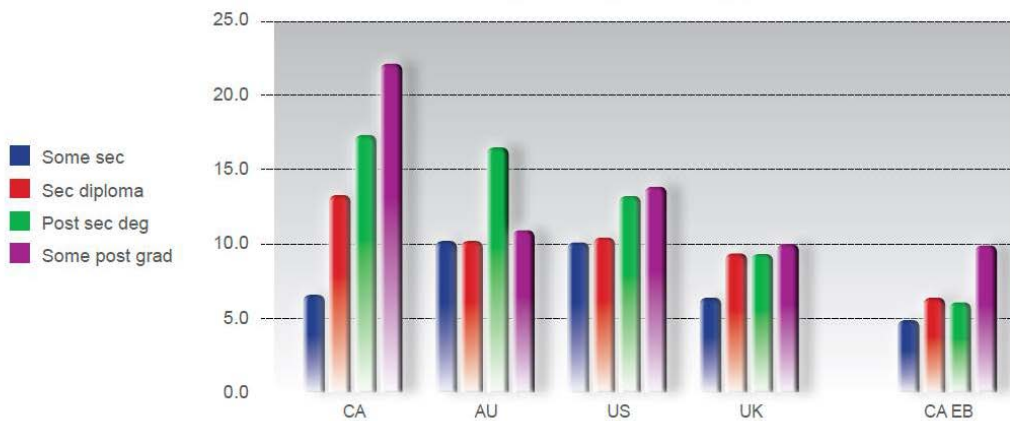
There are strong arguments in favour of boosting the number of Master's and PhD students. One is that productivity rises with education levels; graduate degree holders, the majority of whom have research training, are the most productive. The Institute for Competitiveness and Prosperity noted that Canadians with the highest level of educational attainment are more likely to be employed, are more productive, and earn higher wages.¹ Educated workers are more adaptable in a changing economy; drive innovation, and are a key consideration for high value-added industries in deciding where to locate new facilities. Furthermore, funding for additional graduate students will broaden the pool of young people qualified to join the Canadian research enterprise, and create opportunities to make it more diverse and inclusive. The link between

¹ Institute for Competitiveness and Prosperity., *Looking Beyond GDP: Measuring Prosperity in Ontario*, (Toronto, 2016)

entrepreneurship and higher education is persuasive. Data from the Global Entrepreneurship Monitor clearly demonstrate that entrepreneurial activity rises with increases in educational attainment generally. Furthermore, as the chart below shows, the correlation between entrepreneurial activity and level of education is far stronger in Canada than in comparator countries. Holders of graduate degrees in Canada are considerably more entrepreneurial than in our peer countries, and investment in research can help to leverage this competitive advantage.

The chart below compares data for Canada, the US, Australia, and the UK.² The column on the right shows the educational attainments of owner/managers of Canadian established businesses as a reference point.

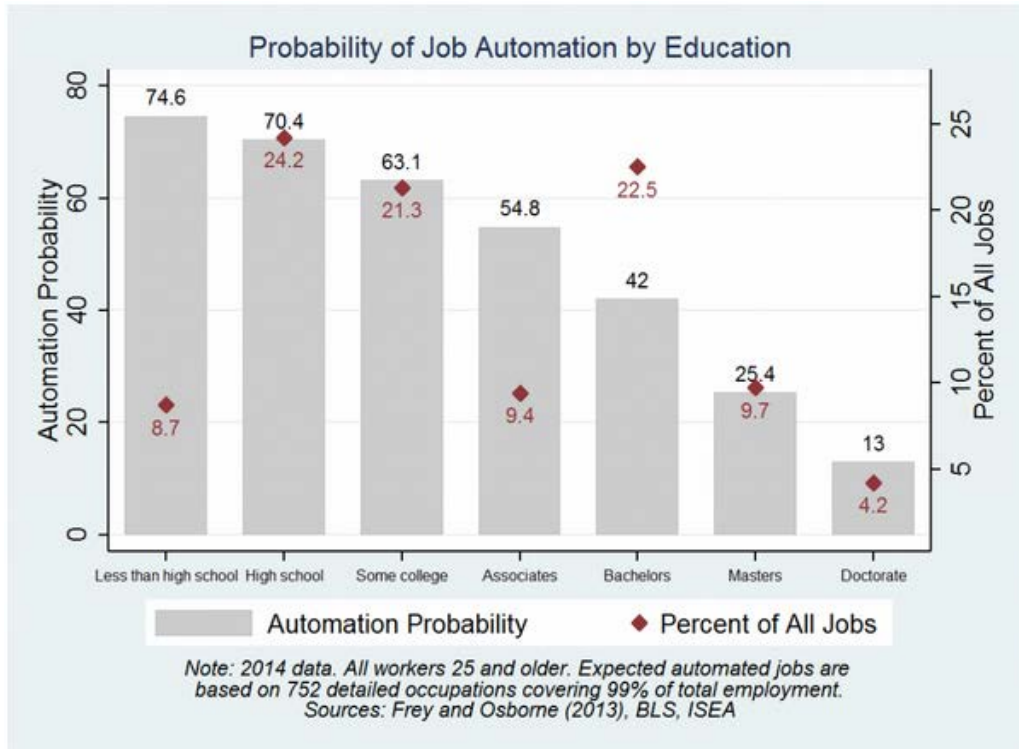
Percentage of the population at each education level reporting entrepreneurial activity



Source: GEM Canada Report 2016

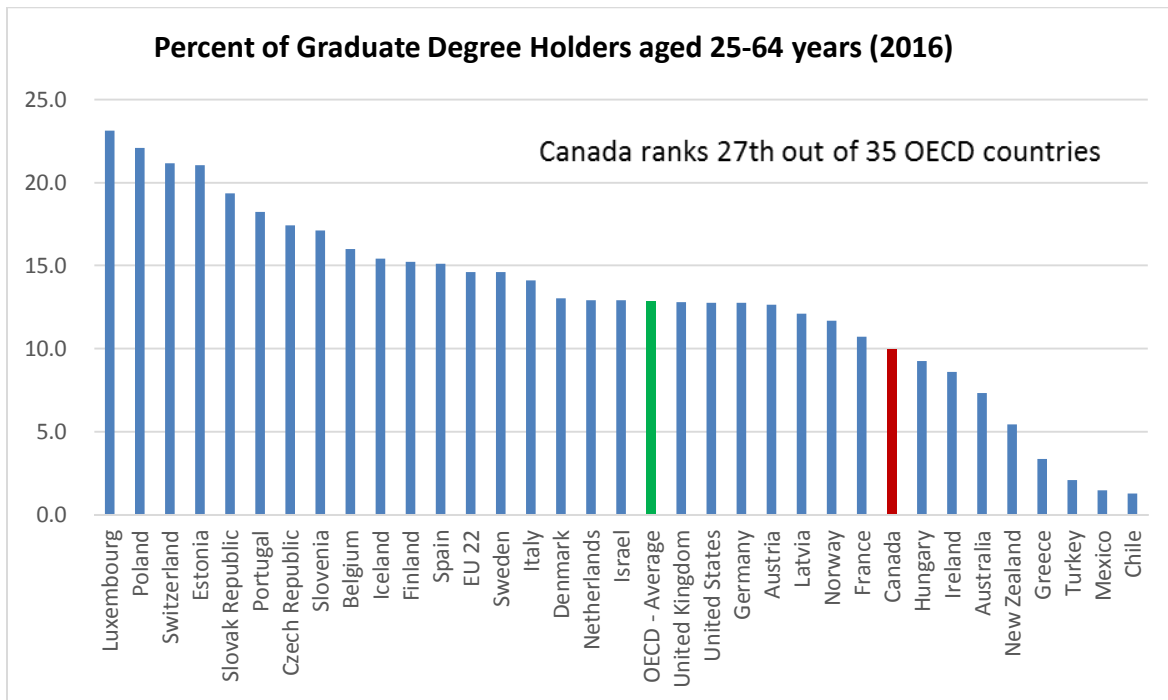
The world is changing at a very fast pace and it is inevitable that a large number of jobs will disappear or change. As noted by the Advisory Council on Economic Growth, nearly half of the paid work currently performed in Canada could be automated by technology that already exists or is being developed. A growing body of evidence suggests that individuals with a university education will be better equipped to adapt to a more automated workplace. Studies also suggest that the probability of job loss due to automation decreases with higher educational attainment. Among those holding doctorates, the probability of job automation is estimated at 13%.

² Langford, C et al., *2016 GEM Canada National Report* (Global Entrepreneurship Research Association, London, 2016)



Source: Institute for special economic analysis, 2017

Although Canada compares favourably to peer countries when it comes to the proportion of our population holding an undergraduate degree, the country lags behind other jurisdictions in graduate education. OECD data show that the proportion of Canadians with a graduate degree is only 10%. This is well behind most OECD countries and below the OECD average of 13%. The gap is even greater among younger adults: 10% of 25-34 year-olds in Canada have completed a master’s or doctoral degree while the OECD average is 15%.” (OECD 2017).



Source: Education at a Glance 2017: OECD Indicators

Both the Advisory Council on Economic Growth and the Fundamental Science Review (FSR) recognized that enhancing support for graduate students, especially at the doctoral and postdoctoral levels, is essential for Canada to increase its supply of Highly Qualified Personnel (HQP). The FSR, in particular, recommended expanding direct support to trainees through scholarships and fellowships awarded by the three granting councils, calling for a total base increase of \$140 million per year phased in over four years. We urge the federal government to move forward with this recommendation as it determines how to better support students through scholarships and fellowships.

Evidence demonstrates that students who participate in undergraduate research programs are more likely to enrol in graduate studies than those who did not have that opportunity. Each year, the Natural Sciences and Engineering Research Council (NSERC) provides Undergraduate Student Research Awards to about 3,000 students, allowing them to gain 16 weeks of research experience in an academic setting at a Canadian institution. Host universities are required to supplement the funding.

McGill University has made increasing opportunities for a research experience for our undergraduate students a priority. We have built on NSERC’s highly successful Undergraduate Student Research Awards program by attracting philanthropic funding to increase the number of awards and implement the model outside of the scientific disciplines eligible for the NSERC

awards. We encourage the federal government to act on the recommendation of the U15 Group of Canadian Research Universities and expand the Undergraduate Student Research Awards program to the Canadian Institutes of Health Research and the Social Sciences and Humanities Research Council.

3 Investing in the full costs of research

At the current level of investment in the Research Support Fund (RSF), Canada's most research intensive universities cannot properly provide support to strengthen university-industry partnerships and encourage university-based contributions to innovation and commercialization. The creation of these complex partnerships and the transfer of knowledge into commercialization and innovation require skilled people to work on long-term engagement with the private sector, knowledge translation and technology transfer. Although these costs are eligible for reimbursement by the RSF, the Fund's reimbursement formula is designed in such a way that the universities that conduct the most research have the largest funding shortfalls. The low reimbursement levels prevent our most research-intensive universities from adequately funding knowledge exchange/transfer activities or require them to do so at the cost of other essential elements of their academic mission.

Canadian university innovation and commercialization performance indicators are often compared to those of the US pointing to on-going underperformance. Underinvestment in the RSF is in part responsible for this lack lustre performance. Although the full costs of research stand at between 40% and 60%, the average RSF funding rate for Canada's 15 most research-intensive universities averages 20.5%. Moreover, the three universities with the highest sponsored research income (the University of Toronto, the University of British Columbia, and McGill University), receive 19.2%, 19.6%, and 19.7% respectively.

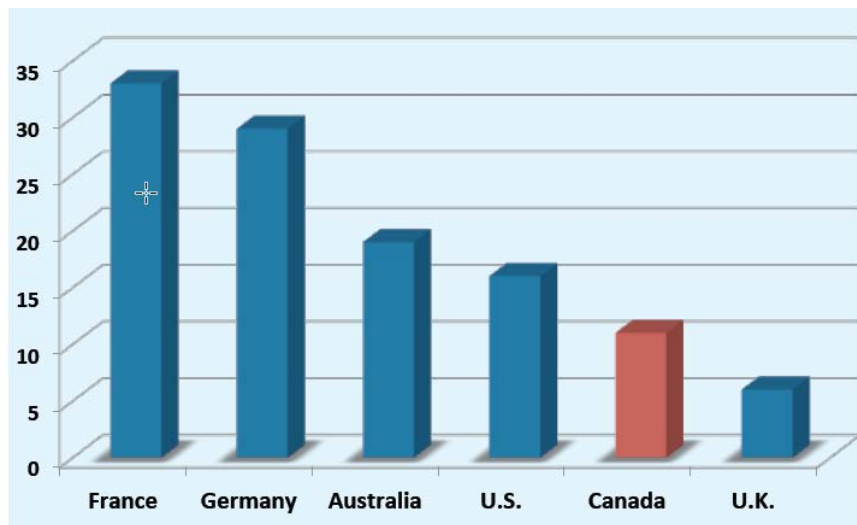
At this level, the RSF for research-intensive universities is insufficient to allow the innovation ecosystem to benefit from Canada's capacity to be at the forefront of global science, a capacity enhanced by the investments in fundamental research made in the 2018 federal budget. We strongly urge the Federal Government to move toward funding the full costs of research by increasing the RSF floor – the lowest average RSF rate received by any one institution – to a minimum of 25% of the direct funding of research. This additional investment is needed to support Canada's aspiration to be a global leader in innovation.

4 International mobility

Student mobility is a two-way street – countries send their students abroad to gain global perspectives and actively recruit international students to their universities. Mobility also leads to broad economic and social benefits for Canada in the longer term.

In a globalized economy, study abroad benefits the workplace. A 2014 European Commission report found that students who studied abroad are half as likely to experience long-term unemployment compared with those who have not.³ Yet Canada has a relatively low proportion of university students who have had international experiences: only 10% of undergraduate students study abroad during the course of their degree.⁴ This compares poorly to Canada’s peer countries, as shown in the chart below.

Percentage of undergraduate students who study abroad during the course of their degree



Source: Study Group on Global Education, November 2017

Financial barriers are the largest obstacles to study abroad, particularly for middle-class and lower-income students. Many jurisdictions, such as the European Union through its Erasmus+ program, provide significant financial support to students who wish to study abroad. Canadian students should also be able to count on this kind of support.

³ The Erasmus Impact Study. *Effects of mobility on the skills and employability of students and the internationalisation of higher education institutions.* (European Union, 2014)

⁴ Study Group on Global Education. *Global Education for Canadians: Equipping Young Canadians to Succeed at Home & Abroad.* (Study Group on Global Education, 2017)

Canada's research universities draw international students from around the world. These students are ideal immigrants. They have been educated in our universities, are familiar with our values, and can move into employment quickly. They add valuable perspectives to our academic communities and have a substantial economic impact: an estimated \$5.86 billion in Canada in 2014.⁵ International students, many of whom want to stay in Canada, provide an exceptional opportunity to revitalize our aging workforce.

5 Recommendations

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6 Conclusion

Canada's universities are key to our nation's economic competitiveness, prosperity and quality of life. They educate the next generation of knowledge workers for rewarding careers. They create new knowledge, make new discoveries, and attract talent from around the world. They collaborate with industry and communities to improve the health and wealth of our nation. Our research universities contribute to innovation, train Canada's most highly skilled workers and entrepreneurs, and improve the lives of people in Canada and globally.

Strengthening Canada's research universities as part of our research and innovation ecosystem is a winning proposition for all Canadians. The government of Canada should leverage the very important investments in investigator-initiated research announced in the 2018 federal budget by:

- enhancing funding for scholarships and fellowships for graduate students and creating additional research opportunities for undergraduate students;
- increasing the number of Canadian students who take advantage of opportunities to gain international experience during the course of their university studies; and
- funding research support at levels that will enable our most research-intensive universities to support innovation optimally.

⁵ Roslyn Kunin & Associates, Inc. *Economic Impact of International Education in Canada – 2016 Update* (Global Affairs Canada - Roslyn Kunin & Associates, Inc., 2016)