



CAGS ACES

Canadian Association
for Graduate Studies

Association canadienne
pour les études supérieures

Investing in the Next Generation of Canadian Researchers
to address a Climate Emergency

August 2019

Investing in the Next Generation of Canadian Researchers to address a Climate Emergency

Recommendations:

Scholarships and Fellowships

- Provide more individual awards
- Allocate 20% of scholarships and postdoctoral fellowships to international trainees
- Establish criteria in assessing research excellence, trainee attributes, and the training environment that focus on the development of researchers for the 21st century
- Establish a prestigious high-value scholarship to support the most promising Indigenous trainees
- Ensure that interdisciplinary research is valued through appropriate, streamlined assessment processes

Training Programs

- Build on the success of current training programs to open training program competitions from every agency
- Establish training program competitions for multisectoral, multidisciplinary, 'grand challenge'-focused research that spans the three agencies

Other

- Establish a system of (small) funding opportunities for trainees to use for professional development, knowledge mobilization, or independent research
- Establish grants to enable universities to pilot innovations in research training

In Budget 2019, the Government of Canada made several commitments related to graduate education and students. CAGS acknowledges the Budget 2019 investment in additional scholarships to be granted by SSHRC, NSERC and CIHR to graduate students and the provision of enhanced parental leave funds for students. These are important investment in ensuring the high quality of the future scholars in Canada - researchers who will address the myriad and varied environmental issues that face Canada and the globe.

We would like to reiterate the points made in our previous submission as well firmly believe that they will enhance the quality and level of readiness of graduate students receiving federal funds.

The work that CAGS has undertaken cover the past few years around rethinking the PhD and in particular on the dissertation have shown the importance of providing wholistic support to graduate students – allowing them to develop their academic attributes and also the attributes that will ensure that they are well rounded and able to step in to their chosen workplace as qualified, creative and fully capable researchers, policy makers, etc.

As the national organization representing graduate education across all disciplines, we are taking this opportunity to contribute to the discussion, and to promote (and reaffirm) some ideas that we believe will truly advance Canada's leadership in addressing climate change. In the statement that follows, we first articulate what we see as the critical attributes and competencies that will be required for Canada's researchers to maintain and improve national standing in an increasingly competitive and changing global research environment. We then outline evidence-based approaches to help achieve these outcomes, and provide recommendations on federal trainee funding policies to accomplish this. The federal granting agencies play an essential leadership role in signaling the required competencies and designing funding programs that support and incentivize the environment required to develop these.

Critical Attributes and Competencies of the Next Generation of Researchers

The 21st century is and will continue to be characterized by changing modes of knowledge creation and innovation. Fundamental disciplinary research remains foundational, but the complexity of today's and tomorrow's urgent problems will require collaborative research that brings together practitioners and researchers from multiple disciplines whose work will encompass both discovery and application. Research careers will often involve changes of sector, focus, and employer. This evolving landscape demands researchers who are adaptable, able to work in multidisciplinary teams, with broad perspectives about research and its role in society, and an ability to communicate effectively with diverse audiences.

Expertise in a researcher's discipline or area of study, rigorous thinking, and creativity remain essential attributes for Canada's next generation of researchers. The acquisition of professional skills such as project management and grant writing remain important, but are no longer sufficient. Future researchers should also be:

- **Globally-connected and competitive.** Researchers need to appreciate and connect with problems, people, and other realities beyond Canada. The research enterprise is global; new researchers must participate in international conversations in their area of study, and their networks need to transcend national borders.
- **Broad and flexible thinking.** Today's problems require researchers to understand and appreciate multiple perspectives and ways of knowing, whether in other disciplines, working contexts, or in approaches to complex multi-dimensional problems. At a minimum, researchers should be able to engage effectively across disciplines, and adapt creatively to diverse environments and ways of thinking.
- **Attentive to and adept in knowledge mobilization.** Effective researchers must be equipped to communicate about their research area beyond disciplinary conversations, and be aware of various knowledge mobilization opportunities and approaches. Depending on the subject area, these may include commercialization, changes to policy or practice, social innovation, or contribution to the public conversation.

Evidence indicates that these attributes are optimally developed through transformational approaches to training that integrate the experience of diverse environments, approaches, and viewpoints with the deep learning of the trainees, and that assist and evaluate the learning so gained. Many of these concepts are articulated in the report of the CAGS Task Force on the Dissertation (which includes the results of a national consultation), and in numerous reports and projects on the future of graduate education.

In addition to these individual competencies, the next generation must collectively be reflective of the diversity of Canadian society in terms of gender, origins and ability. Systemic barriers to the full participation of various groups in the research enterprise not only rob it of talent, but also constrain the substantive breadth of research itself. Given Canada's commitment to reconciliation, the inclusion of Indigenous peoples in all aspects of research is of critical importance. Governments' and universities' commitment to reconciliation require a generation of Indigenous scholars equipped to take up this formidable challenge.

What are the ramifications of these concepts for national funding programs?

Scholarships and Fellowships

Number and value

Direct support of trainees has numerous advantages over indirect support through supervisors' grants. It allows the trainee more independence, enabling them to broaden the research they pursue and to expand the number and type of mentors they have; it allows some mobility if the relationship with or the subject matter of the supervisor are no longer viable; and helps to ensure a higher quality of trainee and provides an important early recognition of excellence. The Naylor Report affirmed this view: "the Panel found more than sufficient evidence to conclude that the personnel awards provided directly by the three granting councils encourage excellence among students and trainees. We believe that they should be not only sustained, but also, ideally, expanded." Again CAGS would like to acknowledge

International Student or Postdoctoral Eligibility

International doctoral students and postdocs comprise an increasing proportion of the Canadian trainee demographic, and are valued for the diverse perspectives and qualities they bring to the research enterprise. Many stay on in Canada or maintain important connections with Canadian colleagues throughout their careers in other countries. Stellar international trainees often receive significantly less funding than their Canadian counterparts on Tri-Council awards, even within the same research groups. This is problematic both on equity grounds and for recruitment of the very best talent.

- **Allocate 20% of scholarships and postdoctoral fellowships to international trainees.**

Assessment

Given the breadth of needed attributes of future researchers, the diversity sought for the research workforce, and the changing nature of research impact measures, we argue that more holistic assessment of trainees, their past research and research potential, and the training environment are needed.

- **Consider broader criteria in assessing research excellence.** In addition to traditional measures, other criteria should include impact and creativity.
- **Consider broader attributes in assessing trainees.** In addition to traditional measures of excellence, demonstration of key personal attributes such as motivation, adaptability, and ability to work effectively in teams should be assessed.
- **Consider the training environment and available opportunities.** Through the information provided by the proposed graduate program, an assessment should be made of whether the program provides an environment focused on developing the '21st century qualities' noted

above. Expectations of international and/or inter-sectoral experience would be valued, as would a commitment to promote and assess trainees' development of key competencies.

Indigenous awards

The Final Report of the Truth and Reconciliation Commission underlines the centrality of education and research to the ongoing process of reconciliation between Indigenous and non-Indigenous Canadians. Not only will research help us understand the 'conditions in which reconciliation either fails or flourishes', but the process of research itself contributes to 'healing and reconciliation'. At present, Canada has far too few Indigenous researchers to achieve this commitment. The market for Indigenous researchers is highly competitive, and the expectations placed on Indigenous researchers to contribute to research and support institutions' commitments to reconciliation are daunting. The Tri-Council could send a powerful signal of commitment to Indigenous research and reconciliation by establishing a doctoral scholarship as lucrative and prestigious as the Vanier, but of longer duration, to support the development of promising Indigenous doctoral students.

- **Establish a prestigious award to support the most promising Indigenous researchers.** Commit to supporting their development as leaders.

Interdisciplinary awards

Given the importance of learning to cross disciplinary boundaries, interdisciplinary research approaches should be valued and encouraged.

- **Ensure that interdisciplinary research is valued.** This may require a separate category of award, or at a minimum, an articulated commitment to interdisciplinary research, and an appropriate and streamlined assessment.

Training Programs

Training programs encourage community, interdisciplinarity, collaboration, and programmatic elements that support rigorous and broadened training. They also can incentivize and facilitate research on complex problems that cross disciplinary and sectoral boundaries, and provide the learning environments that will nurture the types of knowledge, skills, and broad perspectives needed for the 21st century.

- **Offer training program competitions from every agency.** Building on what has worked and not worked in current and past versions of Tri-Council training programs, ensure all disciplinary areas benefit from this approach to research and research training.
- **Establish training program competitions for multisectoral, multidisciplinary, 'grand challenge'-focused research.** As an example, a university (or group of universities) could develop a program on access to water, potentially including trainees from law, environmental studies, engineering, microbiology, and sociology; including Indigenous scholars, NGOs, government, and industry.

Other

One of the barriers to research trainees' growing independence and broadened skills and thinking is the lack of funds to pursue projects or opportunities that promote these. We know, for example, that many trainees yearn to do research and/or mobilize their knowledge outside the confines of the academy, but may be unable to do so if this is beyond the scope of their supervisors' grants or research areas. Small

amounts of funding (e.g., up to \$10,000) for which they can apply would help facilitate these pursuits, and provide some legitimization and recognition of the importance of these endeavors.

- **Offer (small) funding opportunities for trainees to use for professional development, international experience, knowledge mobilization, or independent research.** Professional development opportunities could include formal (and often expensive) programs in such areas as commercialization, filmmaking, or policy development. Knowledge mobilization may involve activities such as creating websites or other communication material, working with stakeholders to develop a policy paper, or validating findings through various means, including engagement with stakeholders.

For many reasons, innovative approaches to research training can be difficult to implement, and there are often barriers to experimentation. Yet now is precisely the time to encourage universities to do just that.

- **Establish training innovation grants.** These would be funds to pilot new approaches to training for the 21st century. Similar to several programs in the US (e.g., NSF Innovations in Graduate Education program, which funds projects ‘aimed at piloting, testing, and validating innovative and potentially transformative approaches to graduate education’), the program would require successful applicants to share their model, and design it in such a way that it could be scalable and assessable. Innovation, creativity, and courage in promoting the development of the next generation of researchers are needed now more than ever, and the Canadian government through the Tri-Councils can play a critical role in supporting and encouraging this.

Conclusion

The ability of Canada to address a climate emergency will rely in significant part on the education and training of the students who will research, identify and implement the mitigation measures and, with luck and hard work, solutions to Canada’s climate challenges.

The measures identified in this submission will improve the opportunities for students to receive the support needed to develop their capabilities and environmentally sound future for Canada’s.