

**Colleges, Institutes, Polytechnics and CEGEPs –
A Sustainable Solution for Engaging SMEs in Business Innovation**

**Submission to the House of Commons Standing Committee on Finance
Pre-budget Consultations in Advance of Budget 2020**

August 2019

Submitted on behalf of the College Applied Research Taskforce

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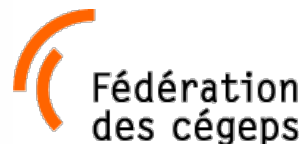


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Recommendation

1. Expand SME participation in the R&D ecosystem by investing \$40 million per year in business innovation engagement services based in colleges, institutes and polytechnics.

Introduction

Small and medium enterprises (SMEs)¹ are key drivers of the Canadian economy, yet they face significant and systemic challenges in accessing the services and support they need to innovate, grow, and thrive in an increasingly global and interdependent environment.

Colleges, institutes, polytechnics and CEGEPs from coast to coast to coast work with SMEs in their communities every day in myriad ways and have seen the results that come when the right services and support are provided in the right way. And they firmly believe they can do more.

A group of national and regional associations representing colleges, institutes, polytechnics and CEGEPs has come together as the *College Applied Research Taskforce* to increase awareness of the current and potential contributions their members make. Following broad consultations with colleges² and their research centres, the group has agreed to submit this single, common recommendation for the 2020 Federal Budget.

Recommendation:

Expand SME participation in the R&D ecosystem with an investment of \$40M per year in business innovation engagement services based in colleges, institutes and polytechnics.

The Challenges for Canada in supporting Business Innovation and R&D

In an environment characterized by climate change, wide-ranging industry disruption and demographic shifts, there is a national sense of urgency surrounding lagging business growth and skills shortages in all corners of the economy. All Canadians would benefit from:

- Growing SMEs
- Increasing export capacity for Canadian business
- Kickstarting investment in industrial research and development
- Increasing the supply of skills to meet labour shortages across all economic sectors, particularly those facing disruption
- Encouraging rural, remote and northern development to provide meaningful opportunities for all Canadians

¹ Small enterprises are defined as less than 100 paid employees, medium as between 100 and 499:
http://www.ic.gc.ca/eic/site/061.nsf/eng/h_03090.html

² References to “colleges” in this submission refer collectively to all publicly funded colleges, institutes, polytechnics and CEGEPs.

As indicated in the Conference Board of Canada's 2018 [innovation indicators report card](#), business R&D continues to receive a very low grade in all provinces compared to public R&D and scientific research.

“Research and development by Canadian businesses has been relatively weak, as measured by R&D spending as a share of Canada's gross domestic product.” [Innovation in Canada, The Fraser Institute 2019]

Part of the challenge underlying the stagnant investment in business R&D is the fact that Canada is a nation of small and medium-sized businesses. Many of these SMEs simply lack the capacity, resources and networks needed to invest in research and business development. According to Statistics Canada, as of December 2017 there were 1.18 million employer businesses in Canada. Of these, 99.8% were small or medium businesses.³ In total, “SMEs employ 89.6% (10.7 million) of the private sector workforce, which highlights the important role SMEs play in employing Canadians.”⁴

Underinvestment in business R&D is related in part to the shortage of talent and skills required to support it. According to the 2018 Report from Canada's Economic Strategy Tables, “talent is the most powerful resource for driving competitiveness and enabling inclusive growth. For companies to scale, compete and innovate, they require people with the right technical, business and entrepreneurial skills combined with real-world, relevant experience.”⁵

A winning formula to increase business productivity for Canadian SMEs must therefore include easy access to the R&D ecosystem, an environment that de-risks innovation and the availability of a skilled workforce. If the mix of these factors is right, the expected results would include:

1. Greater commercialization and export of SME generated goods and services
2. Increased technology adoption and innovation
3. Ready supply of talent for growth-oriented sectors
4. Creation of new jobs in all regions
5. Growth in companies' revenue
6. Rising R&D investment by SMEs

Why Colleges, Institutes and Polytechnics are a crucial part of the solution

95% of all Canadians live within 50 km of a college campus, community learning centre or applied research facility. With over 700 service hubs, colleges play a lead role in Canadian prosperity by developing the talent employers need and by partnering with industry (primarily SMEs) and community organizations in applied research⁶. They provide the expertise required to develop or improve products, processes and services and enhance their partners' competitiveness, efficiency and sustainability. Over

³ ISED [Key Small Business Statistics](#) - January 2019

⁴ ISED [Key Small Business Statistics](#) - January 2019

⁵ ISED [Report from Canada's Economic Strategy Tables](#), 2018

⁶ Applied research is distinct from but complimentary to the fundamental research performed at universities.

the last decade, the capacity of colleges to help solve SME business innovation challenges through applied research has increased considerably – thanks in large part to steady growth in federal government support, from \$15 million in 2009 to over \$85 million in 2019. Budget 2018's significant investment in the Tri-Agency College and Community Innovation Program (CCIP) signaled full recognition of the distinct role colleges play in the Canadian innovation ecosystem. Collaborative applied research also assists colleges in training the next generation of innovators and highly qualified personnel (HQP) by providing students with work-integrated learning experiences that develop their technical and workplace skills such as creativity, complex problem solving, critical thinking, interdisciplinary teamwork, and leadership.

In 2017-2018, federal support, along with investments from the provinces, industry partners and colleges themselves enabled over 7,300 partnerships with private sector, government, non-profit and community partners in all sectors of the economy. These collaborations resulted in more than 4,400 new or improved products, prototypes and services, 87% of which were completed in one year or less.

Examples of applied research collaborations:

- Camosun College teamed up with Clemson University and Anomura Housing Society to manufacture a sustainable and durable 'DIY' technology for affordable housing.
- SAIT's Once Through Steam Generator Laboratory is working in close collaboration with stakeholders in the oil sands industry to find environmentally sustainable solutions to the challenges associated with in-situ steam generation.
- Red River College, the province of Manitoba, New Flyer Industries, Manitoba Hydro and Mitsubishi Heavy Industries have introduced an emission-free All-Electric Bus, a \$3 million, three-year project that is the first of its kind in Canada.
- HRCarbon has partnered with Durham College to leverage Google Maps, creating a web-based 'mash up' tool for calculating and managing the carbon impact of transportation in supply chains.
- The Centre de métallurgie du Québec at the Cégep de Trois-Rivières is developing a new 100% biocompatible titanium alloy for surgical and cardiovascular applications.
- Nova Scotia Community College's Applied Energy Research Lab is working with Solar Global Solutions to prototype a deployable microgrid that can offer remote communities an alternative to diesel generators and potentially improve the lives of the 1.2 billion people around the globe who don't have access to electricity.

The combination of a local, community-focused research environment and the training of a skilled workforce provides Canada with a winning formula to support business innovation and economic growth across the country. This formula now needs to be applied more broadly in order to maximize the impact that colleges can have on business success.

Drawing more SMEs into the innovation ecosystem requires first-hand exposure to and interaction with the talent, technology, partners and possibilities that will help them grow their business. Additional, stable funding for this engagement and outreach work, independent of project-specific grants, will enable colleges and their partners to make more effective use of existing federal support opportunities

and will increase SMEs' own investment in R&D. By proactively engaging with a greater number of industry and community partners over a sustained period, and making this engagement deeper and more consistent, colleges will attract significantly more private sector investment into the R&D ecosystem.

What does engagement and outreach to SMEs involve?

- Equipment and technology demonstrations
- Business assessment site visits and studies
- Brainstorming sessions, hackathons, design workshops, prototyping
- Industry exhibitions, events and trade shows
- Regional economic development activities with business and government
- Campus tours, meetings with faculty, student showcases
- Lab and classroom visits, program overviews
- Market analysis, state-of-R&D studies
- Introductions to partners beyond campus (other businesses, suppliers, researchers from other colleges and universities, R&D service providers, international experts)

What is the SME experience?

- Flexible, streamlined
- Responsive to local context
- Easy to access
- Consistent, timely, personalized

A new \$40M annual investment for partnership-driven business innovation for SMEs

In order to increase the number of SMEs engaged in partnered applied research and the number of communities impacted, Canada needs to provide local R&D support that responds to short-term business needs. Longer-term, this creates pathways for SMEs to the larger innovation system, including the entire range of government, private and non-profit innovation investments and services available to SMEs and would enable colleges to serve as innovation hub “clearinghouses” in thousands of communities across the country.

Applied research services from colleges for SMEs are currently project-based and tied to specific funding opportunities. This creates an R&D environment characterized by instability, unpredictability, and its effectiveness is mostly limited to the short-term. The smaller nature of businesses and organizations that partner with colleges means they generally cannot pay the complete cost of applied research but are willing to invest and increase that investment as relationships deepen and benefits are realized.

The recent evaluation of the CCIP ⁷ highlights that the current mechanism of setting aside 20% of grant funds to cover overhead costs is structurally not effective in responding to the innovation needs of SMEs

⁷ [NSERC Final Report: Evaluation of the College and Community Innovation Program and SSHRC's Community & College Social Innovation Fund](#), 2018

and sustaining future-oriented business development. What doesn't get properly funded is the engagement and outreach needed to draw SMEs and others into the innovation ecosystem at a scale that would make a real difference to Canada's economic performance. The potential is proven but to capitalize on it, a targeted investment is needed, structured in a way that recognizes the longer timelines involved. In the long run, an investment in business engagement services will increase the willingness and capacity of SMEs to invest their own resources in R&D. SMEs would also benefit from a consistent standard of quality and user experience as well as a highly-effective talent stream – and the national network of colleges is well-poised to deliver.

As a result, we are proposing funding that will engage and mobilize SMEs in the technology adoption, partnered innovation and talent development supports available at colleges across Canada.

The measurable outcomes of the business innovation program would include metrics based on:

- Job creation and retention
- Rate of technology adoption
- Prototype development
- Talent development – for faculty, students and the local workforce
- Experiential learning opportunities – for both faculty and students
- Increased revenue / decreased costs for SMEs
- Increased collaboration opportunities with national and international stakeholders
- More private-sector investment in R&D
- Increased investment in equipment and applied research infrastructure
- “Repeat business” as new SMEs connecting with colleges for the first time return to solve further innovation and growth challenges.

<p>We anticipate that in three years, this \$40M annual investment will double the number of SMEs engaging with colleges in applied research and business innovation.</p>

Conclusion

This submission highlights how colleges, institutes, polytechnics and cégeps can work together with SMEs across Canada to help encourage technology adoption, develop innovative solutions and train a skilled workforce to solve the challenges posed by climate change and industry disruption. A new annual federal investment in business engagement services will enable colleges to bring new enterprises from every community and sector of the economy into the national R&D ecosystem for the benefit of all Canadians.