Concept Paper
College Innovation Support Fund

Recommendation

Secure and amplify the long-term impact of college and institute applied research offices in the innovation ecosystem with a new annual investment of $40M for a College Innovation Support Fund.

Introduction

The Colleges and Institutes Canada (CICan) submission to the House of Commons Standing Committee on Finance for Budget 2019 includes the above recommendation on the need for research support funding for college and institute applied research. This concept paper reviews the rationale for the proposal and outlines how it could be implemented.

> **Box 1: Examples of Products and Processes Developed with Industry and Community Partners in College Applied Research**
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> - Biological pesticides and efficient greenhouses
> - Apps to connect vulnerable populations to community mental health services
> - Mobile tracking systems
> - Oceans mapping technology
> - Electric vehicle batteries
> - Wastewater recovery

Colleges[1] across the country play a lead role in Canadian prosperity by partnering with industry (particularly small- and medium-sized enterprises; SME), and community organizations to engage in applied research that enhances their partners' competitiveness, efficacy and sustainability. With over 200 specialized research centres and 400 laboratories, colleges and their students work with partners in all sectors to develop or refine solutions, products, services, technologies, and processes. In 2017 alone colleges collaborated on projects with 4,700 SMEs, 800 large enterprises, 800 government/public agencies and 580 non-profits to develop 700 products, 1400 prototypes, 500 processes and 350 services. Collaborative applied research also supports colleges in preparing the next generation of innovators by providing students with work-integrated learning opportunities. In 2016-17, more than 27,000 students honed their technical skills and gain essential workplace skills, such as creativity, complex problem

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[1] Refers collectively to all publicly funded colleges, institutes, polytechnics and cegeps.

solving, critical thinking, interdisciplinary team work, and leadership. Equipping students with essential skills is more important today than ever before—we stand at the brink of the 4th industrial revolution, which will alter the labour market and the way we work.

The core mandate of colleges is to prepare career-ready graduates and contribute to regional economic development. The vast majority of faculty are hired as teachers to fulfil the training mandate. Provinces and territories have included applied research in the scope of activities colleges are permitted to undertake but do not allocate resources specifically to this activity. Individual colleges choose to invest in applied research where it aligns with their institutional priorities and to the extent that finances permit. This inherently results in a reactive rather than a proactive, strategic or deliberate approach to research activities.

A review of provincial/territorial support for college applied research showed that although approaches and mechanisms vary among jurisdictions, provincial and territorial funding is being directed to college applied research. Most of this is allocated not by the government directly but by individual institutions choosing to use a part of their core operating grants to staff and resource applied research offices. In 2016-17 colleges contributed over $52 million of their core institutional operating budgets to support applied research offices.[2] This represents 20% of all funding reported for applied research activities in colleges and institutes.

Research services are centralized in college and institute applied research offices, which oversee and coordinate all research activity in the institution. Staff in college research offices have deep knowledge of both the institution's strengths and industry and community needs. They drive economic development by forming long-term, meaningful partnerships with industry and community organizations. They are a part of regional innovation ecosystem and liaise regularly with universities, government labs, regional innovation centres, incubators, Industrial Research Assistance Program staff, municipal, provincial and federal government, regional development offices, industry and community associations, industry and community organizations, among others. College research offices set the strategic direction of research within the institution including the mission, objectives and core area(s) of applied research. They are responsible for driving capacity growth of applied research internally and aligning the institution's work with the external economic development agenda.

The Tri-Agency College and Community Innovation Program (CCIP) administered by NSERC supports a suite of grants that encourage and support applied research partnerships with businesses and community organizations. Industry contributes cash and in-kind to CCIP funded projects, directly increasing business expenditures in research and development (BERD) in Canada. Increasing BERD is key to accelerating Canadian business innovation.

College applied research aligns fully with Canada's Innovation and Skills Plan—colleges support the growth of companies and organizations who create new jobs; and equally they elevate students' skills to strengthen communities and solve global challenges. Nowhere is this broad, pan-Canadian integration more evident than in the Economic Strategy Tables. College applied research is poised to implement the recommendations from all six sectors – advanced manufacturing, agri-food, health/bio-sciences, clean technology, digital industries, and resources of the future. Budget 2018's investment in CCIP signaled full recognition of the distinct role colleges play in the Canadian innovation ecosystem. It's now time to

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[2] 2016-17 CICan Applied Research Survey

unleash and scale up the full innovative capacity of colleges by investing in a stable, predictable and annual College Innovation Support Fund.

What is holding colleges back?

Unlike other Tri-Agency research programs, CCIP is not eligible for the *Research Support Fund* (RSF). Instead, CCIP allows colleges to use up to 20% of their project grants to cover overhead and administration costs specific to the grant. This provision is not aligned with the support required to cover indirect costs (see Box 3 for list of indirect costs colleges incur) of the applied research, which are not associated with the costs of any particular project but rather with the foundational supports required by all projects in alignment with the institution's economic development mandate. Using 20% of the award for administration also takes funds away from the direct costs of research, for example an Engage grant in CCIP for $25,000 is reduced by 20% for administration costs. In the university stream an Engage grant for $25,000 is used for the direct costs of research and universities receive funds from the RSF for administration. The use of grant funding for research management is not a sustainable model. Rather, colleges need stable research support funding in order to hire full time staff who are familiar with grant writing, project management and reporting, both in project outcomes and financially.

Colleges incur the same indirect costs that universities do but their focus differs given their economic development mandate, the centralized and expanded role of the research office and the lack of provincially/territorially funded faculty time dedicated research (post-award funding provides "course release" for faculty to participate in applied research).   In colleges, key indirect cost items include:

- liaising and building partnerships with industry, community organizations and research/economic development;
- developing innovation projects with partners;
- recruiting, hiring and training research staff;
- maintaining regulations, and industry relevant accreditations and standards;
- engaging and supporting diverse students and faculty;
- pre-award faculty release time; and,
- growing capacity.

Of the 140 colleges across Canada 115 are currently Tri-Agency eligible. Of these, only 36 have received over $375,000 in average annual Tri-Agency funding over the last two years. Regardless of the size, location, applied research capacity and funding, all institutions must meet Tri-Agency compliance requirements in order to gain and maintain eligibility. The lack of indirect costs funding is challenging for colleges at all stages of capacity growth, but in particular for those at the early stages (under $375,000 in awards annually) as they need to cover the indirect costs of research regardless of the percent administration they receive.

The lack of funding to cover indirect costs inhibits the ability of colleges to maximize their support to SMEs' innovation, and catalyse regional economic development. It also places a considerable financial burden on colleges conducting applied research and is a barrier to entry or to capacity growth in applied research for colleges. Refer to Box 3 for a list of indirect costs colleges incur.

Addressing the Need

The solution is to scale the innovative capacity of colleges across the country and catalyse economic development through the development of the College Innovation Support Fund (CISF) with an annual investment of $40 million, integrated as part of the CCIP. The recently completed evaluation of the CCIP recognizes that the current allowance of 20% of project grants to cover grant-specific overhead and administration costs is not sufficient and that there is a need to update the mechanism that supports indirect costs of research for college applied research.

The CISF will provide stable, predictable and annual funding for colleges, comparable to what universities receive from the Research Support Fund. With this investment colleges will amplify the economic and societal impact of applied research and innovation in Canada and equip students with the skills they and their employers need to succeed in the new economy. There is a wealth of untapped potential in colleges and the time to unleash it is now.

Box 2: Key Elements of Proposed College Innovation Support Fund (CISF)

- CISF is open to all Tri-Agency eligible colleges with approved tri-agency grants.
- Colleges that have received CCIP funds over the previous two years are eligible to apply for a base grant of $150,000.
- Colleges that received over $375,000 per year average funding are eligible to apply for 40% of their 2-year average in addition to receiving the $150,000 base fund.
- Indicators, measures and reporting frameworks that align with objectives and specific outcomes of college applied research and the CCIP.

Anticipated Outcomes

Implementation of the CISF will elevate the applied research enterprise of the 115 Tri-Agency eligible colleges in Canada and encourage others to apply for eligibility. This is important as colleges serve every community across Canada and applied research with colleges directly impacts these communities. A reporting framework would be developed for the CISF that is aligned with the role of colleges in the innovation ecosystem. Some of the key anticipated outcomes and possible performance indicators are outlined below.

Economic and societal impact: The CISF will amplify the economic and societal impact of college-based applied research and innovation in Canada, by providing funds to identify research opportunities with prospective partners, build and maintain research capacity among faculty and students, and maintain a reliable research environment comprised of policies, procedures and state-of-the-art facilities. CISF will foster deeper and more industry- and community-college connections. In turn, this will grow Canadian SMEs—they will create more new jobs, increase revenues, global exports and productivity—and foster more social innovation providing innovative solutions to community and societal problems. Colleges will play a bigger role in Canada's superclusters and form more collaborations with government labs,

universities and other colleges. Entrepreneurs will de-risk innovation and access much needed talent. They will scale and grow. Finally, colleges will ensure that policies that maintain Canadians' confidence in the research process and results are in place, updated as needed and that research staff are trained and compliant. This includes adopting research data management and sharing policies, tools and platforms so that the (non-proprietary) data/results of college research are shared with the greater Canadian research community.

Key Performance Indicators:

- Increased number, type, diversity and scale of college research partnerships with community, industry, academic, government lab and networks/supercluster partners
- Improved regional economic and societal indicators
- Increased knowledge/technology transfer and technology adoption by research partners
- Increased number and maturity of college applied research centres and labs
- Results of college research shared with the research community

Skills Development: The CISF will also foster research, innovation and essential skills development in students, industry and community research partners, by providing funds for training on research methodologies and policies, the incorporation of research within the curriculum, the development of online resources, micro-credentialing and other programs for students and partners, and more work-integrated learning experiences. By way of working alongside colleges, industry and community partners will also elevate their research, innovation and essential skills, and colleges will deepen their understanding of the in-demand skills for partners, which will further impact educational offerings.

Key Performance Indicators:

- Increased training and work-integrated learning opportunities for students
- Improved skills development, especially essential skills in students
- Curricular integration of applied research
- Increased innovation and research skills transferred to collaborative partners

Research Excellence: Finally, the CISF will provide much needed funding to applied research offices enabling them to sustain approaches and programs to foster research excellence including: research ethics processes, intellectual property policies and procedures, research data management systems and greater equity, diversity and inclusivity in applied research.

Key Performance Indicators:

- Number of institutions with Research Ethics Boards and Research Data Management policies;
- Number and types of IP policies used by colleges and institutes
- Baseline data on the number of women, Indigenous and visible minorities involved in applied research and tools in place to measure equity, diversity and inclusion in applied research

Box 3: Examples of Indirect Costs of College Research

- *Liaising and building partnerships with industry, community organizations and research/economic development*: including hosting and travel to industry events, conferences and meetings; human resources including business development staff and faculty time; marketing, developing success stories/video, and maintaining eternally facing web-sites and social media;

- *Developing innovation projects with partners*: including project scoping meetings; writing grant applications; developing/negotiating research contracts and agreements (intellectual property, non-disclosure, etc.); and legal fees;

- *Recruiting, hiring and training research staff:* including centralized research office centre staff (financial, compliance, communications, project management, industry/community liaison and business development staff); project personnel (students, faculty, technicians/technologists) and other college departmental staff (human resources, finance and facilities);

- *Maintaining regulations, and industry relevant accreditations and standards:* including Workplace Hazardous Materials Information System; International Organization for Standardization, among many others;

- *Engaging and supporting diverse students and faculty*: including 'inclusive' outreach/engagement to students and faculty including women, First Nations and visible minorities; integrating research into the curriculum; providing training on research methodology and policies to participate in applied research; and supporting faculty development and helping academic managers to release faculty from teaching;

- *Pre-award faculty release time*: including faculty time to participate in training, industry and community outreach, project and grant development; and

- *Capacity growth*: including strategic research planning, developing and evolving the research mandate, determining resource allocation to research initiatives (grant writing, project development, partnership development).

- *Operating and maintaining state-of-the-art research infrastructure including buildings, laboratories and equipment:* including utilities (water, heating and cooling, electricity, etc.); staff, student and partner training; equipment installation, maintenance and operation; soft- and hard-ware updates; licensing; and janitorial costs;

- *Ensuring institutional policies, processes and procedures are in place, updated as needed and that college staff partners and students are trained and compliant*: including currently mandated Tri-Agency policies (such as Research Ethics, Integrity in Scholarly Research and Scholarship, Intellectual Property, and Conflict of Research); and developing new institutional policies as mandated by the Tri-Agency (such as Research Data Management, which is expected to be mandated following the current consultation process);

- *Maintaining a Research Ethics Board (REB):* including providing training, administrative and financial support to the REB; ensuring the appropriate REB composition; and implementing and maintaining a system for submitting, reviewing and approving research ethics applications; and

- *Gathering performance measures and reporting*: including developing processes for and tracking existing and new performance measures (such as the new equity, diversity and inclusivity measures) and developing reporting for funders.

- *Animal Care Committee*: Ensuring that animal related research complies with the Canadian Council for Animal Care (CCAC), including training, administrative and financial reporting, suitable committee composition, and development of suitable policies and procedures for site evaluation reviews and audits by CCAC.