POLYTECHNICSCANADA

BRIEF: The Distribution of Federal Government Funding Among Canada's Post-Secondary Institutions

Submitted to the House of Commons
Standing Committee on Science and Research
May 2024

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Recommendations

1. Establish an equitable research funding framework that fully captures the capacity of polytechnics and colleges to respond to the needs of Canadian businesses, boosting private sector participation in the innovation ecosystem.

2. Revisit funding models and programs which rely heavily on prior funding success, peer-reviewed publications and patents as indicators of research excellence. Productivity gains should be an important driver of government investment.

3. Consider mechanisms to more evenly distribute research support funding to ensure all players in the academic research ecosystem have sufficient resources to build and sustain a research infrastructure in service of their mandate.

Context

Too often, studies show that Canada ranks well behind its peers on innovation and productivity measures. Business enterprise research and development (BERD) spending over the 2022 fiscal year, for example, was just 0.86 per cent of GDP against an Organisation for Economic Cooperation and Development (OECD) average of 1.99 per cent.[1] This is a gap of roughly $27 billion. Meanwhile, according to Statistics Canada, 50.5 per cent of businesses grapple with at least one obstacle to innovation.[2]

Despite the longstanding suggestion that academic research funding develops an innovation talent pipeline and supports productivity gains, the economic and societal impact of these investments is elusive. At Polytechnics Canada, we believe this can be traced to funding disparities that value investigator-led research at Canada's largest universities ahead of all other forms of academic research support. What the Tri-Councils invest in pragmatic business-identified research is little more than a rounding error.

Total annual investments in academic research by the Tri-Councils was $3.7 billion in the 2022-23 fiscal year. The Canadian Foundation for Innovation distributed a further $386 million. The College and Community Innovation Program – the only purpose-driven program supporting polytechnic applied research – was valued at about $108 million that year. In other words, 119 eligible institutions shared 2.9 per cent of the total investment in academic research. At the Canadian Foundation for Innovation, there were 553 project awards in 2022-23. Only 17 were awarded to polytechnics or colleges.

[1] Main Science and Technology Indicators, OECD, 2024
[2] Obstacles to innovation and measures taken, by industry and enterprise size, Statistics Canada, 2024

While polytechnic and college applied research addresses the barriers to business innovation, solving real-world challenges and applying knowledge to commercial products and solutions, it is under-valued and under-resourced. We believe that because Canada is dominated by small- and medium-sized enterprises (SMEs), many of which under-invest in R&D, better on-ramps to innovation are an important part of a broader research strategy.

As the Committee considers the balance of federal government funding among Canada's post-secondary institutions, Polytechnics Canada strongly recommends that it examine the country's science and research priorities, particularly regarding return on investment. By making Canada's academic research funding more equitable, the proven capacity of polytechnics and colleges can be harnessed to diffuse knowledge, support technology adoption and reap the benefits of investments in innovation activity.

Polytechnic Applied Research

Polytechnics help Canadian businesses in all sectors expand their operations and adopt transformative technologies. They function as both training hubs for the future workforce and living laboratories for innovative research, mobilizing knowledge in service of their business partners, including private firms, not-for-profits and community organizations. Polytechnic applied research also engages students – more than 21,000 each year – arming an innovation-enabled talent pipeline with insights into real-world challenges faced by prospective employers.

Polytechnics pair businesses with expertise resident in their institutions. Partners overcome barriers, explore new technologies and build prototypes with a view to improving productivity and supporting growth. Institutions provide the facilities, expertise and student ingenuity needed to address some of the private sector's biggest challenges and priorities.

Over the last two decades, polytechnic applied research capacity has increased significantly. Research objectives are defined by the partner, approximately 85 per cent of which are SMEs. This approach encourages private sector innovation and leverages both in-kind and cash contributions from the business partner. In a recent study conducted by Polytechnics Canada, 50 per cent of business partners reported productivity improvements stemming from their applied research collaboration and 44 per cent indicated an intention to fund future R&D activity internally. In a country that struggles with business investment in R&D, these are excellent indicators.

Unlike approaches designed to "push" innovation into the market, polytechnics respond to market demand and support businesses in their own efforts to overcome near-to-market challenges. Importantly, this collaborative model allows partners to retain intellectual property associated with innovation, facilitating unencumbered commercialization.

Simply, an investment in polytechnic applied research is an investment in business innovation. Applied research both fosters private sector innovation and derisks industry engagement. In fact,

for every dollar invested by the federal government, polytechnics leverage $2.24 from other sources.

In 2022-23, the 13 members of Polytechnics Canada conducted 3,389 research projects and addressed the needs of 2,656 partners. They co-developed 2,678 prototypes. Our recent study suggests that for every dollar invested in applied research, there is a return that ranges from a low of $8.24 to a high of $18.82.

Research partners report a host of other benefits associated with polytechnic applied research:

- 89 per cent point to an economic or social benefit emerging from the project
- 51 per cent indicate improved competitiveness
- 50 per cent believe the collaboration increased their R&D capability
- 28 per cent gained access to new markets
- 21 per cent report increased productivity
- 15 per cent say the project created new jobs within their organization, many of which are filled by students who worked on their project

While the institutions do not retain intellectual property arising from the projects, most integrate findings into their curricula, extending the benefits to a broader group of students headed into the labour market.

Review of Federal Research Funding Programs

As the government responds to last year's report from the Advisory Panel on the Federal Research Support System, we believe polytechnics could be better utilized to achieve economic impact. Regardless of the value of fundamental research, it is unthinkable that government would respond to the panel's recommendations without a plan for translating research findings into productivity improvements in every sector of the economy.

Polytechnics and colleges excel in applied research that directly addresses practical challenges and fosters innovation in key sectors, such as advanced manufacturing, clean technology and healthcare. Applied research derisks innovation activity for partner businesses and organizations, helping them adopt new technology, test ideas, make process improvements and overcome limitations to growth. In a country of small businesses without built-in R&D capacity, innovation intermediaries offer a critical service.

Even better, because polytechnics do not retain intellectual property arising from a partnered project, those best positioned to unlock the economic value – businesses themselves – are empowered to realize the commercial impact of their R&D activity.

As the Tri-Council structure is revisited and a new capstone research organization is implemented to consider how research investments can generate tangible economic impact, we strongly

recommend a complete review of funding streams and programs. There are longstanding barriers to accessing federal research funding, the most prevalent being a system designed in service of incumbents. Simply put, the research funding playing field has been designed to unfairly advantage research-intensive universities. In today's environment, this is untenable.

Evaluating Polytechnic Research Proposals

Facilitating the broader participation of polytechnics and colleges cannot be achieved by simply expanding eligibility across Tri-Council programming. While doing so may provide equal opportunity to *apply* for funding, it is unlikely to result in equitable *access* to awards. Eligibility must be accompanied by responsive evaluation criteria and a strong understanding of institutional missions and focus.

To begin, the credentials and expertise of researchers in polytechnics and colleges often differ from those in universities, reflecting institutional mandates. While university researchers typically hold advanced academic degrees and pursue publication, polytechnic researchers often possess a combination of academic qualifications and industry-specific knowledge. Prized for their ability to apply theoretical knowledge to real-world problems, polytechnic researchers are less inclined to publish or patent than they are to undertake pragmatic research to address industry needs and deliver tangible outcomes.

Further, university faculty are paid to divide their time between the classroom and research endeavours whereas college faculty are paid primarily to teach. Time dedicated to applied research projects must be back-filled in the classroom, making faculty-release provisions in funding awards a basic requirement often overlooked in traditional funding programs.

The criteria for assessing "good research" may also differ. While both university and polytechnic research are characterized by rigour, innovation and academic integrity, the emphasis on practical applicability and industry relevance is more pronounced in the college sector. Peer review evaluators must be encouraged to recognize factors such as industry partnership, technology transfer and demonstrated impact as having equal value to publication history.

Funding Continuity

While no funding stream is guaranteed, a degree of continuity is paramount to sustained momentum and long-term partnership development. Currently, the demand for grants supporting applied research far exceeds allocated funding, creating uncertainty and limiting the ability to plan and execute research initiatives.

For example, while university-centric funding streams generally include ongoing commitments, polytechnics and colleges were provided a three-year, diminishing investment in Budget 2023. The proposed return to pre-pandemic funding levels in 2026 does not encourage or support long-term strategic growth in the research enterprise.

Moreover, polytechnics and colleges are not eligible to receive overhead allocations outside of their grants. In the university sector, the Research Support Fund provides operating funds to sustain the research enterprise. Polytechnics and colleges are required to allocate 20 per cent of their grant award to overhead, both diminishing the funds available to support research projects and requiring institutions to achieve a sustained level of grant awards to maintain continuity of service. The Research Support Fund is allocated based on total grant award value in prior years; the College and Community Innovation Program is ineligible as a source of funds, again illustrating a bias for university research in federal funding mechanisms.

A thriving research ecosystem relies on continuity. We urge the Committee to recommend an ongoing financial commitment to the College and Community Innovation Program to a new permanent baseline of $125 million per year alongside a review of other existing funding streams and programs to ensure the capacity of polytechnics and colleges is fully realized in the research ecosystem.

Member Success Stories

We are pleased to provide tangible examples drawn from our member institutions. These case studies are just two of the 30 presented in our recent study of the economic impact of applied research. We would be pleased to provide others upon request.

Humber: Automated Aircraft Maintenance Data Processing and Analytics

MHIRJ Aviation, based in Montreal, provides maintenance and support services to regional aviation operators. They embarked on a five-year project to better inform maintenance needs and allow for rapid preventive maintenance, reducing down-time and increasing operator profitability. NSERC funded 60 per cent of the project activity, with remaining funds, student supervision, and access to equipment and proprietary technology provided by the company. Like much polytechnic-based research activity, this project focused on practical technology extension rather than discovery research. The ability of the company to retain intellectual property was critical given their business model and the use of proprietary technology. Meanwhile, by involving students, the company opened a recruitment channel, paying dividends beyond project outcomes.

Northern Alberta Institute of Technology: Boreal Forest Restoration

The Alberta Land Stewardship Act requires boreal forest restoration when industrial activity has been completed. NAIT has now undertaken a number of projects focusing on plant propagation and seed delivery to aid land restoration efforts, researching natural seed collection, germination and First Nations seed-gathering training. Germination and propagation studies are conducted at NAIT facilities. Funding typically stems from companies with restoration obligations, NSERC and/or First Nations using commercial seed bank revenues. Student involvement has been significant.

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About Us

Polytechnics Canada is a non-profit association representing 13 leading research-intensive, public polytechnics and institutes of technology. We advocate for federal action in areas where polytechnics provide solutions for a more innovative, productive and globally competitive country.