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Standing Committee on Science and Research
House of Commons
Sixth Floor, 131 Queen Street
Ottawa, ON K1A 0A6

Dear Members of the Standing Committee:

RE: Study on the distribution of Federal government funding among Canada's post-secondary institutions

Colleges like Georgian play an essential and significant role in Canada's research and innovation ecosystem. This is exemplified through the partner-driven, applied research results in:

- new and/or enhanced prototypes, products, programs, processes and services that drive business growth and economic development;
- creative, meaningful and sustainable solutions to local and international issues;
- advancements on policy challenges, such as supporting Canadian industrial transformation; and
- contributing to solutions that address critical global priorities, including the United Nations 17 Sustainable Development Goals.

With urgent demands to address Canada's economic prosperity, such as providing affordable housing, ensuring food security, preparing for and preventing large natural disasters, designing cities and spaces that respect our environment, transitioning to clean energies, and taking care of an aging population, Canada's colleges can play a bigger leadership role in applied research. Each of these areas is a strategic opportunity for us to be a key part of solutions, mobilizing our collective strengths and value-add partnerships in service of our country's most pressing challenges.

As the federal government considers how to better capitalize on its research investments, we welcome a reimagined distribution approach and ask for stronger funding for colleges so we can strengthen and expand our overall impact.

<u>Transformative work of Canadian colleges</u>

- Research questions are largely determined by external partners with practical implications for local enterprises.
- About 80% of research projects are completed in under a year – resulting in immediate and tangible impact/results.
- Intellectual property generated remains with local partners, ensuring research results flow to the Canadian economy to maximize innovation and productivity gains.
- In 2021/2022, $151M in federal funding allowed:
    - Canada's colleges to work with over 8,800 partners on 8,154 projects in key sectors of the economy (a 26% increase over two years).

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- Development of over 6,400 new prototypes, products, services, or process improvements.
- Partnerships with small- and medium-sized enterprises (SME) - 62% of these partnerships were with SMEs that don't have the capacity or resources to conduct cutting-edge research on their own.
- 27,000 students contributed to applied research projects, supporting innovation in various economic sectors and gaining a competitive advantage through immersive experiences.

Source: Colleges and Institutes Canada

Georgian drives local and regional impact

- Georgian is the primary postsecondary institution in Central Ontario, with seven campuses (Barrie, Orangeville, Orillia, Owen Sound, Midland, Muskoka; and South Georgian Bay), serving Simcoe, Grey, Bruce, and Dufferin counties, the District of Muskoka, and the Municipality of York.
- Research, social innovation and entrepreneurship at Georgian are under one departmental umbrella. This allows for unique partner-led opportunities, enables creative collaborations and positions us to a have greater influence and impact, by having a department focused on regional socio-economic development. This department connects the community with Georgian's expertise, resources, students, and grant funding.
- We are Canada's first and only Ashoka U designated changemaker college, one of Canada's Top 50 Research Colleges, a signatory of the *Dimensions* charter, and have a strategic leadership role within our central Ontario community in the development of Ontario's new Regional Innovation Centre in Barrie.
- Since 2023, 297 research projects have been completed with 93 industry partners, engaging 29 faculty members and 801 student researchers.
- Since 2017, we have received over $10-million in funding that's allowed over 3,400 students to contribute their skills to 280 local businesses. Our Henry Bernick Entrepreneurship Centre (HBEC) supports more than 210 new entrepreneurs annually, and over the past decade HBEC clients have generated over $20-million in revenue.
- Our applied research focuses on immersive technologies including:
  - **Competitive smart manufacturing:** industry 4.0 in product and process development; advanced technologies in manufacturing; and digital twinning.
  - **Digital advantage:** big data analytics; machine learning/predictive maintenance; and artificial intelligence, across all sectors.
  - **Sustainable utilities:** power storage and quality; demand load management; GHG/carbon accounting; and waste and wastewater management.
  - **Thriving communities:** inter-professional health-care practices; mental health and wellness; and inclusion and belonging.
- Georgian brings business or industry ideas to life by connecting partners with faculty, student and employee researchers who have the expertise, skills and knowledge required to address research and development needs.
- Our projects focus on driving outcomes in product design, prototyping, market research, analysis, testing and e-business solution development.

- Georgian opened the Peter B. Moore Advanced Technology Centre at our Barrie Campus in 2018 thanks to generous investment of all four levels of government, private donors and industry partners. It's a hub for research activity that includes collaboration spaces, emerging technologies in robotics, mechatronics, manufacturing and assembly, houses the only anechoic chamber in the region.
- Current collaborations:
    - Following a successful project with Beaver Rock, researchers are now designing, manufacturing, commissioning and integrating a fully automated, multi-featured modular setup for filter embedding and K-Cup filling/sealing equipment to improve internal operating efficiencies, expand Beaver Rock's offering for their customers, and commercialize equipment and supplies for sale into the marketplace.
    - A team is developing a progressive, integrated web-based application for Central Painting, a national commercial and industrial painting contractor, allowing their employees to efficiently track progress and share information, while allowing for fast and accurate analysis reporting. The project is in the commercialization stage.
    - We have collaborated with Skinopathy, an artificial intelligence (AI) based startup, to improve health-care outcomes by leveraging big data and AI for early detection of skin cancer, with the goal of providing a high-performance health-care solution. We are now harnessing the power of data and AI to improve the accuracy and efficiency of the lesion detection process to better assist in early detection and diagnosis. They're also working on optimizing a skin lesion classifier using new data and developing a depth algorithm for 2D stereoscopic images.
    - To improve productivity and efficiency, we are working with Honda Canada Mfg. to design, manufacture and integrate a robotic cell for Banjo Bolt assembly, which is currently a labour-intensive and human-oriented job at their plant in Alliston. The opening of their new EV Battery production plant in our campus regions will generate a need for more SME applied research as the regional supply chain grows to support the manufacturing. Georgian is already positioned to support this research and development.
    - We have launched a new applied research project with the YMCA of Simcoe/Muskoka to help the organization re-envision how it supports our community. The Future of Belonging project, funded through NSERC, is a community initiative aimed at boosting community wellness by building capacity, resources and connectedness within our unique semi-urban-to-rural context.
    - Georgian's in the final stages of a project with the Simcoe County District School Board and Ashoka Canada (NSERC-funded) to develop a toolkit to equip educators to nurture key skills and mindsets associated with social innovation in their students – from primary through to postsecondary.
    - In partnership with Lakehead University – Orillia, we are supporting Central Ontario businesses with the commercialization of their intellectual property, funded through a new initiative with Intellectual Property Ontario.
- Sample success stories:
    - We partnered with Environmental Systems Corporation to develop a display that interacts with the clean room and monitors, logs, and graphs critical data points, such as temperature, humidity, and differential pressure, using remote monitoring and

- predictive maintenance capabilities. They piloted SmartCritical™ at a major pharmaceutical manufacturer in the US and 105 units were installed at Fusion Pharmaceuticals in Hamilton, ON, in May 2023.
- We collaborated with Central Painting to develop a progressive, integrated web-based application that allows their workers to efficiently track progress and share information, while also allowing for fast and accurate reporting and analysis. The prototype is completed and successfully tested by a group of experts from CP, mentors from HBEC and faculty leads from R&I along with the students who are working on a commercialization plan.
- We collaborated with Royal Victoria Regional Health Centre (RVH) to develop an easy-to-use web application prototype available on multiple devices to provide a prognosis and care options (Goal of Care Discussion) to ensure patient understanding of their clinical condition by eliciting patient values and priorities regarding care to guide treatment preferences and decisions. The application was implemented at RVH, tested and is being reevaluated to move forward to the complete commercialization stage.
- We completed several pandemic-related research projects, including:
  - NSERC-funded collaboration with Waypoint Centre for Mental Health Care and Royal Victoria Regional Health Centre on understanding the experiences and needs of mental health-care providers.
  - OCI funded collaboration with Environmental Systems Corporation to develop the SmartCRITICAL™ system which is a connected critical environment with increasing importance for manufacturing during COVID-19.
  - CFI-funded project to develop a mobile COVID-19 screening station for 360 Technology and Innovation Group Inc., that built on their existing monitoring platform.

- Partner testimonials:
  - "One of the greatest successes we've had working with Georgian is it really exposes us to some younger, diverse, and vibrant talent." - Aaron Styles, CEO, Environmental Systems Corporation
  - "The students undertook all the work under the direct supervision of research faculty and staff. We're thankful for our collaboration with Georgian and look forward to new projects that we're hoping to discover together." Dan Saso, President and CEO, Beaver Rock Roastery Inc.
  - "Working with the Georgian team was an interesting collaboration in taking a concept from zero to field testing. We're slowly performing Beta testing in the field and the concept is being well received by our boots on the ground site users. We're looking forward to sharing their feedback and working through some debugging and future modifications." Scott Gribbon, National Operations Manager, Central Painting.
  - "The students did a great job pushing the needle on the Skin Cancer and Depth Algorithm tasks, and the next team can continue the collaboration with Georgian". Rakesh Joshi, Data Scientist, R&D Lead, SKINOPATHY.
- Knowledge dissemination:
  - Georgian holds a Research, Innovation, Entrepreneurship and Scholarship Symposium each spring with guest speakers, live sessions and workshops, inspiring participants to think critically. Research showcases demonstrate innovation happening across the

- college and collaboration with our partners. Hundreds of community and industry partners, alumni, students and employees take part, to see what we have collectively achieved.
- We received a College and Community Social Innovation Fund (CCSIF) through our partnership with Ashoka Canada to work on the Growing a Region of Changemakers Project to build educator capacity to measure and support students' growth as social innovators using participatory action research. The outcome of this project was presented at multiple conferences and events including International Social Innovation Research Conference (ISIRC) 2021 and 2023.
- Through a Project Funded by the Future Skills Centre, we aimed to modernize higher education by introducing XR for enhanced teaching, learning, and collaboration. It focused on developing digital competencies among graduates, exploring XR's potential in creating inclusive experiences for underrepresented groups, and examining its implementation in a large organization. The results of this project helped us develop the Best Practice Report that is under review for the publication.
    - Deschamps, I., Doran J.A., Forlani, C., Theriault, R., Thadani, A., Madorin, S. (2023). *Virtual Reality Anatomy in Higher Education: Efficacy, Learning Motivation, and Institutional Adoption.* Canadian Journal of Technology and Learning (Submitted)
- Other peer reviewed publications include:
    - Stibbards, A. (2023). *'The Tool of Our Trade': Defining and Teaching Empathy in College Programs. The Canadian Journal for the Scholarship of Teaching and Learning*, *14*(1).
    - Wilton MJ; Karagatzides, JD; Solomon A; Tsuji; LJS. (2023). *An Examination of Outdoor Garden Bed Designs in a Subarctic Community.* Arctic, 76(1).
    - Anzola, D; Limoges, J; McLean, J; Kolla NJ. (2022). *Effects of the COVID-19 Pandemic on the Mental Health of Healthcare Providers: A Comparison of a Psychiatric Hospital and a General Hospital.* Frontiers in Psychiatry, vol 12.

Overall challenges Georgian and other Canadian colleges face

- Canada's colleges have matured rapidly as research institutions, but federal research funding has not kept pace with the increasing demand – especially from community organizations and SME.
- In 2021, 3.1% of federal research funding flowed to Canada's college research ecosystem – which includes more than 120 institutions from coast to coast focused on responding to business, community and policy challenges. In contrast, 76.1% of federal research funding flowed to universities in the same year.

Recommendations

As a sector, we call for:

- increased overall research funding to scale up the number of partners and projects Canadian colleges like Georgian can tackle,
- consideration of sector challenge funds (overarching, strategic funds focused on fostering innovation on a specific theme, priority or complex problem), and

- stronger support for college-led applied research networks focused on strengthening and expanding collaborations to address key and specific economic and societal challenges.

Expected outcomes of additional support

More investment in colleges, would help to:

- supercharge our sector's ability to respond to local, regional and national issues,
- increase innovation through partner-driven collaboration, resulting in more rapid solutions,
- enable colleges to better contribute to improve and maintain our economic competitiveness, and
- provide more opportunities for students to gain research experience, resulting in graduates with innovative skills and mindsets that can benefit and help transform their future workplaces and communities.

Sincerely,

Kevin Weaver
President and CEO

c: Dr. Mira Ray, Executive Director, Research, Innovation and Entrepreneurship, Georgian College