

SCHOLARLY NOTE: SEVEN KEY STRATEGIES FOR BUILDING APPLIED RESEARCH CAPACITY AT YOUR CANADIAN COLLEGE

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Abstract

Canadian colleges play an increasingly vital role in applied research, supporting regional innovation through partnerships with industry, community, and government. Backed by programs like the Tri-Agency College and Community Innovation (CCI) fund, colleges have expanded beyond their teaching mandates to tackle real-world challenges through practical, solution-focused research. However, many institutions still face barriers due to limited internal resources, inconsistent faculty engagement, and administrative structures designed primarily for education. This paper outlines seven key strategies identified by Canadian college research leaders to build and strengthen applied research capacity: (a) focus on core funding programs, (b) align with federal priorities while exploring

other sources, (c) engage local industry and community, (d) integrate research with student programming, (e) collaborate with internal departments, (f) leverage marketing to promote impact, and (g) learn from established institutions and associations. These strategies offer a roadmap for colleges at any stage of research development to enhance sustainability, relevance, and long-term impact.

Keywords: Applied research, Canadian college, Research capacity building, Research integration, College research

Résumé

Les collèges canadiens jouent un rôle essentiel et croissant dans la recherche appliquée, appuyant l'innovation régionale grâce à des partenariats avec l'industrie, les communautés et le gouvernement. Avec l'appui de programmes comme le Programme d'innovation dans les collèges et la communauté (ICC), les collèges ont élargi leur mandat au-delà de l'enseignement afin de relever des défis concrets par une recherche pratique axée sur des solutions. Cependant, de nombreux établissements d'enseignement font encore face à des obstacles liés à des ressources internes limitées, à l'engagement du corps professoral et à des structures administratives conçues principalement pour l'enseignement. Cet article présente sept stratégies clés identifiées par des leaders de la recherche collégiale au Canada pour développer et renforcer la capacité en recherche appliquée : (a) se concentrer sur les programmes de financement de base, (b) s'aligner sur les priorités fédérales tout en explorant d'autres sources, (c) mobiliser l'industrie et les communautés locales, (d) intégrer la recherche à la formation des étudiants, (e) collaborer avec les départements internes, (f) tirer parti du marketing pour promouvoir l'impact, et (g) apprendre des établissements plus établis. Ces stratégies offrent une feuille de route pour les collèges, quel que soit leur stade de développement en recherche, afin d'améliorer leur durabilité, leur pertinence et leur impact à long terme.

Mots-clés : Recherche appliquée; Recherche collégiale; Collèges canadiens; Renforcement des capacités de recherche; Intégration de la recherche.

Canadian colleges have a wide national distribution with over 95% of the Canadian population living within 50 km of a campus (Colleges and Institutes Canada, 2024). These institutions have long histories of playing key roles in supporting economic development and growth as well as workforce development and talent cultivation by offering diploma and certificate programs that emphasize practical, hands-on training for specific careers. In addition, over the past 20 years, colleges have significantly increased their value to the communities they serve by partnering with

industry and community to conduct practical, solution-oriented applied research that directly addresses real-world challenges.

College expansion towards conducting applied research has been supported through the establishment of the college-specific Tri-Agency College and Community Innovation (CCI) funding program. This funding is used to support colleges partnering with private, public, and not-for-profit sectors to conduct applied research aimed at creating economic, social, health, or environmental benefits for Canada

(Colleges and Institutes Canada, 2024). Although Canadian universities have a history of basic and applied research, Canadian colleges place a strong emphasis on applied research focused on developing practical solutions through industry and community partnerships. These partnerships lead to outcomes such as the creation of prototypes, new products, and process improvements (Association of Colleges of Applied Arts and Technology of Ontario, 2006; Holmes, 2017).

Despite a 20-year history, many Canadian colleges struggle to integrate and build applied research. This ongoing struggle stems from several factors, including colleges' historical focus on teaching and learning, with administrative, departmental, and institutional structures primarily designed to support those activities. Further, building a college research program requires significant internal funding resources, faculty engagement, infrastructure and space allocation, as well as industry partnerships, which are not easily achieved (Association of Colleges of Applied Arts and Technology of Ontario, 2006; Bélanger et al., 2005; Fisher, 2009; Holmes, 2017). As a result, building, developing, and advancing applied research at Canadian colleges poses diverse, unique, and complex challenges. Without addressing these challenges, engaging and expanding applied research at Canadian colleges will be hindered.

To support applied research growth, 22 applied research leaders from Canadian colleges across the country—spanning those just beginning to build research capacity to those with over 20 years of experience in applied research—came together to identify key strategies for advancing and supporting applied research (see details in the Methods Appendix). Applied research leaders included directors, associate directors, research personnel (leads and scientists), faculty, and research managers. The seven identified strategies were designed to assist others in comparable roles at Canadian colleges seeking to further develop their research initiatives.

THE SEVEN KEY STRATEGIES

The applied research leaders identified seven key strategies for building and strengthening research capacity in Canadian colleges. These strategies are as follows.

Strategy 1: Understand Standard Funding Programs and Focus on Research Partnerships

Knowing and understanding standard funding sources is a critical first strategy for building a Canadian college applied research program because this funding will be the foundation for any applied research program's sustainability and growth. For college research, it is important to be aware of two main types of funding: grants for conducting research (e.g., CCI, NSERC Applied Research and Development grants, Mitacs internships) and grants for acquiring infrastructure and equipment (e.g., NSERC Applied Research Tools and Instruments, Canada Foundation for Innovation College Fund). When starting to build your research program, prioritize grants that support research activities over infrastructure grants. The reason for this is because research-focused grants offer opportunities to build partnerships with businesses, non-profits, and communities, as well as hire research personnel, including students, to conduct research activities. Having a history of providing student experiences and engaging in partnerships that address industry and community needs will be necessary when applying for infrastructure grants to support current or future research initiatives, setting you up for the potential of a more positive outcome when applying for equipment and infrastructure funding. In addition, working in partnership with industry and community will provide a sense of the type of equipment or infrastructure that will be needed to address current partner needs and develop new research opportunities.

Strategy 2: Build Capacity Through Federal Funding Programs While Keeping an Eye Out for Other Funding Sources

Developing a research program that aligns well with federal funding program priorities is crucial to supporting immediate and future research activities. Federal programs, like CCI, have established timelines and guidelines, allowing for easier long-term planning around building an applied research program. As you plan and strategize the development of an applied research program, having the option of funding opportunities from a stable and predictable source—rather than relying on infrequent funding sources—will minimize your development setbacks and help you build more effectively. In addition, aligning your research program with national priorities increases your chance for federal funding, giving your program a powerful foundation to thrive and build a strong, lasting reputation.

Although building around federal funding programs should be the primary focus, especially in the early stages of research program development, it is also important to explore provincial and other funding sources to diversify options and adapt to changes in funding structures over time. For example, the province of Nova Scotia offers the Productivity and Innovation Voucher Program through Invest Nova Scotia, which is a Crown corporation that serves as the province's business development agency. This program links industry with academic research institutions to conduct research that drives economic growth in the province. Similar funding exists in other provinces, such as the Ontario Centre of Innovation's Collaborate 2 Commercialize and the Innovate BC Ignite programs. However, the drawback of these provincial and other funding sources is that they are subject to frequent changes and shorter funding cycles and may not always align with your college's applied research initiatives. Use these funding programs to supplement your main research-funded initiatives or use them to explore new opportunities with industry and community partners.

Strategy 3: Determine What Industry Sectors are in Close Vicinity to the College and Their Research Development Needs

Understanding the industry and community sectors located near the college campuses offers valuable insights into regional needs, allowing you to tailor research initiatives that address specific challenges and support local innovation needs. Developing a research program that supports local industries and communities can contribute to the social and economic growth of the region, which strengthens the college's reputation and fosters support regionally. Furthermore, as the college's strategic priorities will align with regional industry and community needs, developing a research program that supports regional challenges will ensure that your research program aligns with the college's broader mission and will help strengthen institutional support, improve long-term sustainability, and position the research program as a key contributor to the college's overall mandate. Research that aligns with industry and community needs is more likely to gain support from senior college administration (deans, vice-presidents, etc.), which will be needed as the research program expands and requires more space and administrative support.

A key step to understanding the industry sector and community research needs is actively engaging them. This can be done through industrial environmental scans, industry engagement sessions, and strategic planning exercises. The information gathered from meetings with industry and the community will help determine regional needs, assess market fit, and identify where the college can provide the most value. Meeting with industry and community will reveal two types of research needs. First, you may uncover a company-specific research need, where an individual business has distinct internal challenges that they are seeking to address. For example, a company may require you to develop a new type of wastewater treatment system or test their newly developed soil amendment to see if it can enhance crop

yield. Understanding these company-specific research needs will help identify the funding opportunities that are best suited for the project. If no suitable opportunity is available now, this knowledge will prepare you for when the right funding becomes available. Further, if your college does have the capabilities to address industry research needs, but no funding opportunity available or the industry partner needs to address their needs right away, a fee for service or partner-funded contract could be explored.

Second, engaging with industries will also help identify broader research and infrastructure needs. For example, there could be a sector-wide concern where research is needed that could engage multiple partners in a joint venture. These sector-wide research needs are most often identified through meeting with sector organizations or economic development centres not individual companies. In addition, these meetings will identify specific equipment or infrastructure access needed by industry or communities, which is ideal information to garner support for equipment or infrastructure grants. Furthermore, once these needs are identified, building value propositions around them is essential. These propositions should clearly articulate how the college's research capabilities can address specific industry challenges and contribute to regional innovation.

Once you understand the industry and community sectors around your college and their research needs, you may find some sectors have multiple focus areas along the value chain that can be addressed. For example, in the agricultural sector, food production could involve three potential research partners, each with specific needs. Consider whether your research program should focus on supporting producers with specific growing challenges, agricultural associations with broader grower concerns, sector supply companies providing products like biostimulants or fertilizers. In the end, it may be a combination of all three. The focus you choose may end up being dependent on the ability of a specific group to contribute financial support for the research, which is a crucial requirement for many federal and provincial funding programs. In addition, the chosen area of focus may also

be influenced by the college's internal strengths. Conducting a thorough assessment of internal research capabilities prior to reaching out to industry and community will help ensure that your strategic direction is fundable and grounded in institutional expertise, which is essential for building sustainable research capacity.

Strategy 4: Link Research With Student Programming

Linking your research program with existing student programming will also build and enhance applied research program capacity. Having a research program that links well with student programming can create a pipeline of student research assistants who can actively contribute to projects. Student engagement is a key evaluation criterion for federally funded college grants, making it essential to involve students in the research process. Further, research opportunities can be a significant draw for students who are looking for post-secondary programs that offer practical, career-focused experience. For students, engaging in research activities provides exposure to real-world challenges, hands-on experience with cutting-edge technologies, and advanced training in specialized skills. These types of experiences allow a student to build a strong résumé that can give them a competitive edge before entering the workforce. In addition, student research activities that connect to industry partners provide occasions for students to demonstrate their capabilities directly to potential employers. This can open the door to future job opportunities with the partnering company.

Student engagement is a key selling point to gain support from senior college administration for applied research and align with the college's strategic workforce development priorities. By creating these opportunities for students, you can build stronger administrative backing over time as your research program grows. In addition, providing students with unique experiences can yield long-term benefits for your research program as many of these students will go on to work for companies or run their own businesses that may require research services. Since many companies are unaware

that colleges conduct research, having alumni with first-hand experience may help secure future research opportunities.

When developing a research program, it will be advantageous to think broadly about the overlap of applied research projects and student programming, rather than focusing on one specific student program. There are often multiple programs across different disciplines that can support research initiatives. For example, research involving irrigation could include plumbing students for installation and setting up the irrigation system, as well as students from agricultural studies. Expanding the pool of student programs to draw from will provide unique student experiences for those in programs that are often under-represented in applied research projects.

Strategy 5: Build Relationships With Your College's Departments

Building relationships with key departments such as human resources, finance/accounting, procurement, and facilities is essential for developing a research program, as these departments provide crucial administrative and infrastructure support. Since research is still relatively new in the college environment, its requirements do not always align with existing college guidelines, policies, and practices, making collaboration with these departments particularly important. For example, research hiring needs—such as short-term contracts, consultants, or stipends—may not align with current human resource policies. In addition, purchasing equipment through an infrastructure grant will have specific requirements that may not align with your college's procurement policies. A strong relationship with procurement ensures that resources are obtained quickly and efficiently, preventing delays that could hinder research timelines and undermine industry partnerships. Having a strong relationship with facilities can also support building a strong research program, especially when a project requires new equipment to be purchased and installed, or electrical, plumbing, or design work to be completed. These types of expenses may not be eligible under your infrastructure

grant, necessitating additional facilities support funds to set up a research space or equipment. Prior to submitting any grant, it is important to familiarize yourself with these policies to ensure your plans align with college practices.

Additionally, by building relationships and collaborating with relevant departments, you may be able to create exemptions for applied research activities that allow funding requirements to be met while working outside standard college operating policies and procedures. It is best to start building these relationships early in your research program development. If amendments are made to support research activities, it will be important that you also work with the department to create relevant standard operating procedures (SOPs) for those amendments. These new SOPs will be necessary in the long term, so that knowledge is not lost as personnel changes occur in the departments. Understanding the unique workflows and needs of each department helps streamline processes to address the frequent and varied nature of applied research projects.

Although departments like human resources and facilities may have a greater influence on day-to-day operations, building strong relationships with the foundation, college fundraising, and alumni relations departments are equally important. These connections play vital roles in supporting long-term research goals through strategic partnerships and community engagement. These departments play a strategic role in cultivating relationships with companies and the broader community. Through their networks and outreach efforts, they can significantly extend the reach and impact of applied research by connecting you with potential industry partners.

Strategy 6: Promote Your Research Activities Through the College Marketing Department

The marketing department is always looking for ways to share interesting stories about what is happening at your college. Applied research projects that solve industry and community problems, especially when students are involved,

make great stories. By leveraging the marketing department's expertise in communication and branding, you can create compelling narratives that showcase the value of the research to internal and external audiences. The marketing department can help amplify the visibility of your program, attract potential partners, and engage stakeholders. Collaborating with marketing not only boosts the program's profile but also helps to build support from administration, industry partners, and the broader community. Good opportunities to involve marketing are when a project is awarded and while you are actively conducting the research. Engaging partners in marketing stories adds to credibility and can be a good source of persuasive quotations describing the impact of the research. When considering marketing and media releases, be sure to respect any funder restriction periods or partner confidentiality expectations that may affect what and when information can be shared.

Through their marketing department, some colleges publish dedicated community impact reports that focus on applied research, innovation, and workforce development. These reports showcase a range of projects undertaken in collaboration with industry and community partners, demonstrating the significant contributions colleges make to local, regional, and national economies. These reports can be used to help communicate the vital role colleges play in supporting economic development by making them available in campus common areas, shared with alumni, and distributed to provincial and federal ministers.

Strategy 7: Reach Out to Other Institutions and Associations for Help

There is a wide wealth of knowledge across the Canadian colleges already doing applied research. Research InfoSource Inc. releases annual reports on the top 50 research colleges in Canada. If you are just starting out or trying to enhance your college's research capacity, any one of these leading institutions can provide a wealth of information about what they have done

to succeed, errors made, and signals to heed. Reaching out to these colleges can offer valuable guidance, helping you accelerate the development of applied research at your institution. In addition, associations such as Colleges and Institutes Canada (CICan), Tech Access Canada, Polytechnics Canada, Réseau des CCTT–Synchronex, and the Canadian Association of Research Administrators (CARA) can also help.

FINAL THOUGHTS

Applied research being conducted at colleges offers valuable student experience, as well as regional economic development opportunities. Starting and growing applied research within your college will be full of excitement and challenges. For established applied research colleges, these seven strategies reinforce existing guidelines and offer additional insights to help further develop your research program. For institutions just starting out, the seven strategies will guide you and provide you with a roadmap based on what others have encountered.

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AUTHOR CONTRIBUTIONS

Mathew R. Vankoughnett conceived the design. All authors contributed ideas and writing the manuscript.

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METHODS APPENDIX

The identification of strategies to build applied research capacity at Canadian colleges was conducted using a collaborative, workshop-based approach that took place at a Colleges and Institutes Canada (CICan) Applied Research Leadership Institute meeting held June 22 to 27, 2024. A total of 22 individuals participated in the meeting, representing 15 post-secondary institutions. These institutions spanned multiple Canadian provinces and territories, including British Columbia, Alberta, Saskatchewan, Ontario, New Brunswick, Nova Scotia, Newfoundland, and Yukon. The 22 individuals were all actively involved in applied research within their respective institutions as directors, associate directors, research scientists and leads, as well as managers and faculty.

The seven strategies that were developed, were created through a series of structured team-based workshops that brought together these individuals to collectively explore challenges and opportunities associated with applied research across the college sector. Within these sessions, participants worked in small groups to generate and refine strategies aimed at enhancing the functional effectiveness and scalability of applied research activities. Outputs from the workshop sessions were consolidated and synthesized into a unified set of strategies. This synthesis process involved aggregating ideas generated by different groups, identifying common themes, and refining recommendations to ensure clarity and coherence.

To enhance the credibility and rigour of the findings, the synthesized strategies were reviewed by three experienced senior college applied research leaders that oversaw and taught the programming at the meeting. These individuals, named in the acknowledgement section, provided expert feedback to validate the relevance, accuracy, and applicability of the proposed strategies.