

# Canada's Future in Science and Technology

## Making it Work



Association of Canadian Community Colleges (ACCC)

Submission to the

House of Commons Standing Committee  
on Industry, Science and Technology

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As the national and international voice of Canada's 150 publicly-funded community colleges, institutes of technology, cégeps, university-colleges and polytechnics across Canada, a primary role of the **Association of Canadian Community Colleges** is to engage proactively in discussions and debate with respect to the role and capacity of these institutions in the nation's economic and social development. With campuses in over 1000 communities across the country, 1.5 million full-and part-time learners, and 60,000 professionals, our institutions play a pivotal role in training a highly skilled, technical workforce and conduct applied research and development activities that enable businesses to improve, develop and enhance products, processes and services.



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# INTRODUCTION

The Association of Canadian Community Colleges (ACCC) welcomes the opportunity to provide input to the House of Commons Standing Committee on Industry, Science and Technology's study into Canadian science and technology. ACCC hopes that this study will define a more strategic and robust role for Canada's colleges and institutes in the federal government's science and Technology Strategy – *Mobilizing Science and Technology to Canada's Advantage*.

Canada's colleges and institutes are inextricably linked to the industrial and technical drivers of the economy - *the Entrepreneurial Advantage* - and are important contributors to Canada's innovation system. They represent the largest concentration of relevant expertise to support the application of technology and product development in Canada.

The time has come for the federal government to recognize that colleges and institutes are major partners in Canada's economic development. To date, the federal government has all but ignored this part of our wealth creation equation.

Most colleges and institutes were established in the mid 1960s as a revolutionary type of post-secondary institution designed to educate unprecedented numbers of "baby boomers" and to supply the skills that even then immigration alone could not meet. The impetus was federal and provinces responded. The very foundation of today's college system was rooted in a pan-Canadian partnership.

The federal, provincial and territorial governments must make the skills crisis a national priority, and take action. The possibilities are tremendous, but a renewed national partnership is a necessary condition for success.

The Association believes that the following areas are in urgent need of attention in the context of the federal government's study into science and technology:

## **The Skills Crisis**

- Investing in the Recapitalization of Canada's Colleges and Institutes
- Increasing Student Engagement in Science and Technology

## **Enhancing the "Entrepreneurial Advantage"**

# THE SKILLS CRISIS

Our future prosperity will be dependent upon workers who are capable of accessing information and applying this information to solve problems. The demand for skills has risen tremendously and has become critical in key sectors. Businesses are looking to our colleges and institutes to prepare more graduates adept in technology adoption and the application of knowledge to the development of new products, processes and services. Employers demand more graduates who can rapidly integrate into the workforce and who have studied science and technology, worked on state-of-the-art equipment and can enhance corporate competitiveness through innovation. Equally, colleges and Institutes provide skills updating of the existing workforce.

Colleges and institutes are under extreme pressure to meet these needs. Our institutions have been squeezed by chronic underfunding that limits their ability to remain on the leading edge, to invest in the latest technologies and to provide professional development opportunities for faculty and staff. In addition, increasing space shortages have resulted in thousands of qualified students languishing on waiting lists.

The opportunity cost for students, employers and the overall economy is enormous. Waiting will not solve the crisis.

*A recent survey by the Canadian Federation of Independent Business (CFIB), reported that CFIB members facing severe labour shortages required the skills of college graduates on a ratio of six to one compared to university graduates.*

*Source: Canadian Federation of Independent Business, Immigration and Small Business: Ideas to Better Respond to Canada's Skills and Labour Shortage 2006*

## Skills Crisis - Investing in the Recapitalization of Canada's Colleges and Institutes

Four decades ago, through major federal investment, Canada built college facilities with an anticipated life span of 40 years. While these institutions remain positioned to deal with the skills crisis, they require recapitalization.

As educators and trainers of Canada's workforce, college and institute faculty are also impacted by the rapid pace of technological change. The financial realities have severely inhibited colleges and institutes to remain on the leading edge, invest in the latest technology equipment and ensure the constant currency of their faculty and staff.

### Recommended Action:

- Establish dedicated funding for college/institute facilities, technology and equipment.
- Create a Faculty Development Fund to support the professional development of college/institute faculty in science, technology and trades.

## Skills Crisis - Engaging Students in Science & Technology

Fostering education in science and technology will ensure that today's students can generate and test new ideas and contribute to the scientific developments and innovations of tomorrow. Reaching out to Canadians, especially young Canadians, and making them aware of the broad range of science, technology and trade programs offered by colleges/institutes must be a central focus of Canada's science and technology strategy.

Canada's S&T future will not be possible if investment in people is solely targeted at the university educated.

*"The government will help students demonstrate their value by sponsoring hands-on-research internships and, through scholarships, help increase the supply of the highly qualified and globally S&T graduates that businesses need to succeed in today's economy."*

*Mobilizing Science and Technology to Canada's Advantage 2007, page 14*

The Government of Canada can help put in place the right conditions to attract, retain and develop the talent and ingenuity Canada needs. Colleges and institutes are well positioned to increase the capacity of industry through the skills, talent and knowledge of their college graduates.

However, students need greater opportunity to develop new ideas, to translate them into marketable products and services, and to realize commercial potential. Students from Canada's colleges and institutes need further opportunities to be involved in applied research projects and industry internships. Current student expertise can also benefit businesses. An example is the federal government's Student Connections Program through which 300 students help 10,000 businesses annually with respect to business applications.

### Recommended Action:

- Establish a College/Institute Student Internship Program similar to the NSERC University Undergraduate Industrial Award Program. A college/institute specific internship program would respond to the federal government's commitment to expose more students to private sector research challenges.
- Establish a National College and Institute Scholarship Program in Science and Technology. This national program could be based on the successful model implemented by the federal government in the 1990's – the Canada Scholarships Program in Technology and administered by the Association of Canadian Community Colleges.
- Renew and expand the Student Connections Program.
- Expand and create new international academic mobility programs to ensure a global literate Canadian workforce.

## ENHANCING THE ENTREPRENEURIAL ADVANTAGE

*“Many of Canada’s 150 community colleges and polytechnics located in over 1000 communities across the country work with local business organizations to develop and adopt new scientific developments and technologies”*

*Mobilizing Science and Technology to Canada’s Advantage 2007, page 36*

*The Red River Raycer, an award-winning solar powered vehicle developed by students in the MET program received national media coverage as it completed the 2005 North American Solar Challenge. An example of a winning combination of advanced knowledge and modern technologies with practical, hands on learning to produce leading-edge solutions.*

*Students and faculty from Nova Scotia Community College in partnership with the Brain Repair Centre re-designed the apparatus that injects stem cells into the brain of Parkinson’s patients. This is a classic example of how a college reacts to industry need, provides its applied research expertise and produces results.*

Federal government investments in innovation activities over the past decade have overwhelmingly been focused on “technology push,” with enormous investments made in largely university-based research. Very little investment attention has been given to “market pull” strategies, particularly in the context of the development and support for innovation activities in SMEs.

There is a large number of small and medium-sized enterprises (SMEs) in which few or no technical staff are employed resulting in little or no product or process innovation, research or development. As such, there is a limited ability to initiate or deliver human resources development initiatives to enhance productivity and maintain competitive positions. Few managers in Canadian SMEs have backgrounds which enable them to adopt, apply and adapt technology to its full potential.

SMEs need support for research and development activities that are focused on their needs and goals, and the productivity and competitiveness of their businesses. SMEs need help sourcing and incorporating new knowledge and technology. SMEs need help developing and testing new and improved products, processes and services. SMEs need entrepreneurial skilled employees and business management structures that enable them to be innovative.

Colleges and institutes are the natural choice for Canada to support its SMEs. With 150 colleges located in over 1000 communities, no other institutional infrastructure exists in Canada with this breadth and impact. Colleges are mandated to support economic development and they deliver programs that meet the economic needs of their regions. They help businesses start, develop and grow. In partnership with business, colleges and institutes conduct industry-led applied research and development activities that enable business to improve, develop new or improved products, processes and services – to become better at what they do.

It is time for Canada to look at its enormous investments in research from the perspective of the SME community. Canada must balance its investments in research more equitably between support for large scale discovery research and support for college/institute-industry partnerships. A rare example of federal government recognition is the support by the federal regional agencies of the importance of college/institute-business partnerships to economic development. At the national level, the NSERC College and Community Innovation (CCI) Program announced in budget 2007 is supporting only 25 college/institute-industry partnerships.

While appreciated, the small scale of the program in no way unleashes the college/institute full potential for contributing to Canada’s science and technology future.

### Recommended Action:

- Expand the College and Community Innovation (CCI) Program.
- Create a free standing College/Institute Innovation Program.
- Create a National Advisory Committee for College/Institute–SME Innovation. The Committee would:
  - ◆ be comprised of representatives from colleges, industry, government, granting councils, and other relevant stakeholders.
  - ◆ have as mandate to review current policies and to make recommendations to the government on how best to enhance the capacity of the college/institute system to support Canada's S&T Strategy.
  - ◆ conduct a national study to capture the extent to which College/Institute-SME Partnerships have an impact on Canadian companies' performance. While colleges have been successful in documenting their applied research activities, impacts on industry have been more difficult to capture.
  - ◆ develop benchmarks and instruments for measuring success. This would include defining indicators and instruments with the purpose of establishing a set of flexible, manageable indicators and benchmarks to effectively measure research capacity, performance, and the extent to which colleges and institutes are meeting the goals of Canada's S&T Strategy.