

**Polytechnics Canada's Submission to the
Government of Canada's
Consultation on a Digital Economy Strategy for Canada**

**Relevant Themes:
Building Digital Skills for Tomorrow
Capacity to Innovate Using Digital Technologies**

July 9, 2010

SUMMARY

The Government's Consultation Paper on a Digital Economy Strategy for Canada overlooks, even undervalues, the key role played by Canadian colleges and polytechnics. Any digital economy strategy for Canada must take advantage of the technical and technological education offered by colleges and polytechnics and recognize the significant contributions of these institutions to Canadian productivity through successful collaborations with small and medium-sized enterprises (SMEs). Canadians at all points in the learning continuum are embracing a large variety of information, communications and technology (ICT) skills from degrees to diplomas and certificates obtained at polytechnic institutions.

Polytechnics Canada is an alliance of nine colleges and institutes in key economic regions of Canada, graduating over 11,000 workers each year for the ICT-related sectors. A defining feature of polytechnic education is the emphasis on advanced applied education and applied research. SMEs benefit from these applied research services and the supply of high-quality skilled workforce-ready graduates who can assist these firms with the commercialization of their innovations. Our members help to introduce ICT into SMEs from the non-traditional ICT sectors. Better linkage of ICT labour demand with College Program Advisory Committees would provide more timely and relevant labour market information. A Creativity Transfer Fund would provide vital late-stage commercialization assistance to many smaller firms, enhancing the efficiency and effectiveness of existing programs such as the Industrial Research Assistance Program (IRAP).

Canadian polytechnics and colleges train learners for the digital economy. Canadian polytechnics and colleges help to grow SMEs for the ICT and wider sectors. The Government would do well to turn these strengths to a national advantage.

ABOUT POLYTECHNICS CANADA

Polytechnics Canada is the voice of advanced applied education and applied research. We represent an alliance of colleges and polytechnics that have a common focus for advanced technical and technological education to improve productivity innovation in Canada. Our nine members are committed to knowledge transfer, creating innovation-literate learners for Canada and putting research into practice for our industry partners.

The current members are located in the key economic regions of Canada:

- Lower Fraser Valley - British Columbia Institute of Technology (BCIT)
- Calgary/Oil Sands Corridor - Olds College, SAIT Polytechnic
- Kitchener/Guelph/Waterloo High-tech triangle - Conestoga
- Golden Horseshoe - George Brown, Humber, Seneca and Sheridan
- National Capital Region - Algonquin College

With more than 128,000 full-time students enrolled, collectively, members of Polytechnics Canada represent 21 percent of the overall full-time enrolment of the

college system, while only 6 percent of the country's colleges. Interestingly, 15-20% of the full-time students enrolled at Canada's polytechnics have already completed a university bachelor degree, but have come to a polytechnic to gain the skills that will make them employable. Each year, Polytechnics Canada's members graduate over 38,000 students from certificate, diploma, apprenticeship and degree programs. Over 11,000 of these graduates have gained credentials in ICT and business-related programs.

Equally relevant for ICT up skilling is the fact that we represent over 414,000 part-time and continuing education students. With a post-graduation employment-in-field rate of over 90%, colleges are supplying Canada's ICT and business sector with the next generation of innovation-literate, highly skilled ICT leaders who are able to make an impact on their company from day one.

We Train

The nine members of Polytechnics Canada currently offer 377 full-time programs in ICT-related fields: from certificates, diplomas and degrees to post-graduate certificates. We train ICT technicians, technologists and practitioners for the Canadian economy. Some unique ICT degree programs offered by our members include Health Informatics Management at Conestoga and 3-D Modeling and Visual Effects Production at Humber. This does not include the part-time and continuing education programs that are offered in which Canadians embrace new ICT skills at all points in the learning continuum. According to Statistics Canada data from 2007/08, enrolment in technology or business-related programming equals 28.8 percent of the entire Canadian college sector's total enrolment, while the equivalent value for the universities is 23.1 percent.

The members of Polytechnics Canada are also leaders in the delivery of e-learning technology and curriculum.

We grow SMEs in the ICT sector

A majority of our research activity directly benefits SMEs. These smaller firms, without an in-house R&D capacity, seek our applied research services for late-stage commercialization and to integrate ICT into their business. Often our SME partners come from the non-traditional ICT field, where digital adoption or adaptation has been slower. Our faculty and students are, in effect, ICT dispersers for the country.

(Examples of the above successes will be found at the end of the paper.)

Key Concerns with the Consultation Paper "Improving Canada's Digital Advantage"

Our association applauds the Government of Canada for the consultation effort, jointly led by Industry Canada, HRSDC and Canadian Heritage, on ways to improve Canada's digital economy. However, there are some glaring omissions and assumptions in the consultation paper that cause concern. First, when discussing the "Capacity to Innovate Using Digital Technologies", the call for more "collaboration among companies, research

centres and universities" (Improving Canada's Digital Advantage, page 11), overlooks the vital contribution provided by Canadian polytechnics, institutes of technology and colleges to our country's innovation. The same chapter mentions a concern that Canada lacks business and managerial skills when it comes to innovation performance, but overlooks the multi-skilled training of Canadian polytechnic education. Many of our degree programs and other three-year credentials are designed to equip the technically-trained graduate with core business and management skills needed for the private sector.

Secondly, in the chapter on "Growing the Information and Communications Technology Industry" the statement that "it will be important for governments and the private sector to identify ways in which to attract more students to university ICT degree programs" demonstrates a strong lack of awareness of the many ICT-related degrees now offered at colleges and polytechnics across Canada. Our nine members alone offer 27 baccalaureate degrees in ICT-related fields.

These oversights indicate that as all partners in Canada seek to enhance the digital economy, much more needs to be done to gain awareness of the depth and breadth of college and polytechnic credentials designed to produce a high quality labour market supply of ICT technicians, technologists, and practitioners. Without such an awareness we are perpetuating a bias that ICT skills can only be gained through university education and we are undervaluing the thousands of ICT graduates from the college and polytechnic sector.

As the Government of Canada moves to implement new initiatives and programs to improve our digital advantage, mapping the full set of ICT-related credentials already on offer in Canadian publicly-funded post-secondary education institutions will be a prerequisite to any action.

RECOMMENDATIONS

The following two key themes being considered in the Consultation directly impact or involve our members and our students:

- Key Theme 1 - Building Digital Skills for Tomorrow
- Key Theme 2 - Capacity to Innovate using Digital Technology

Recommendation on Skills/Talents:

- The Federal Government should take the lead in developing a national ICT Skills Strategy that is ***inclusive*** and involves all levels of government, industry, universities, colleges, sector councils, trade associations and secondary schools.
- The Federal Government should invest in programs that foster increased enrolment in next generation ICT careers by using existing programs (such as the Canada Social Transfer that funds post secondary education, and specifically-targeted training programs at HRSDC) as well as through new initiatives.

- The Federal Government, through its HRSDC suite of programs, should focus on effective ICT re-training of lower and mid-skilled workers, technicians and technologists.
- The Federal Government should harness the transformative, flexible and results-oriented training offered by the college and polytechnic sector and move to an approved service provider model for delivery of workplace training for ICT skills. Those teaching and learning institutions with a proven track record of generating ICT-ready workers should be recognized and supported through a standing offer model of service delivery. Smaller firms seeking to increase or improve the ICT skills of their workforce would have the confidence that these approved service providers could provide efficient and relevant training for their workers.
- The Federal Government should support and drive national collaboration between employers and post secondary education institutions (focusing not solely on universities, but also including polytechnics as well as colleges).
- All governments should make better use of existing ICT training programs and industry-oriented College Program Advisory Committees (PAC). The federal government can do more to foster links between the PACs and the Sector Councils. Improving labour market information and linking supply/demand in ICT through the use of PACs would be one option. (PACs consist of members from diverse backgrounds—community, industry, government, other educational institutions, regulatory bodies, professional associations and labour— who meet at least twice a year and play a critical role in ensuring that the curriculum provides the most relevant education to create job-ready workers for the needs of the marketplace.)
- In seeking more ICT graduates, industry and government should include and recognize graduates of Canadian college and polytechnic ICT programs when recruiting. The Public Service of Canada can lead by example by ensuring that, as the largest employer in Canada, it also recruits college graduates with degrees and diplomas when hiring for ICT-related jobs.

Recommendations on ICT Innovation:

- Polytechnics Canada supports the Information Technology Association of Canada's (ITAC) recommendation for expanding the scope of the Scientific Research and Experimental Development (SR&ED) program to make all credits refundable ensuring that all R&D investors benefit from the program. Expanding access and eligibility to refundable SR&ED credits will help high-growth companies weather tightened credit markets during the vital phases of commercial development for Canadian innovations.
- The Federal Government should pilot a "Creativity Transfer Fund" that would enable faculty and students from polytechnics to conduct small-scale proof-of-

commercial concept projects in partnership with SMEs. This process could act as an efficient pre-qualifier for the National Research Council's IRAP program where, upon completion of the project, the SME could approach IRAP with their commercial concept in hand, validated through our research expertise, and begin a partnership to bring their innovation closer to market. This would help the government maximize the effectiveness of IRAP's R&D support for Canadian SMEs. This pilot program would also benefit from the inclusion of innovation-literate polytechnic students, and enable SMEs in Canada's ICT sector to create and fill the well paying, long-lasting, high quality new jobs of tomorrow.

Sample of Successful ICT Programs at Canadian polytechnic institutions

Sheridan College's Bachelor of Applied Arts – Animation is the only such college degree program of its kind in Canada. Sheridan is a leader in animation training. The program offers cutting-edge 3-D computer animation with professional hands-on instruction. Students in the program benefit from a new Animation Centre that is a designated space created to support teaching and film production.

Olds College's Bachelor of Applied Science – Agribusiness program provides learners with a strategic perspective on the emerging role of technology and innovation in the agricultural sector. The unique approach to one of Canada's most traditional sectors allows students to explore the complex roles of entrepreneurship, management and innovation within the context of today's changing business environment.

Algonquin College's Bachelor of Applied Business in e-Business Supply Chain Management is part of the College's mobile computing (laptop) initiative, which better prepares students for an increasingly technology-oriented workplace. Graduates apply current business process improvement methodologies using technology to create more effective business solutions.

SAIT's Administrative Information Management is a specialized two-year diploma program in the School of Business – the only one like it in Canada. The program is a mix of business theory courses and hands-on computer applications training. Graduates have a firm understanding of how to gather, analyze and present various types of business information. At the end of the second year, students complete a one-month practicum in a business environment.

Select Success Stories: Industry Links for Members of Polytechnics Canada

George Brown/Infonaut:

Infonaut, a Toronto-based company with 10 employees in the health geographic information system (GIS) sector, has been working with George Brown College (GBC) to provide students with applied research opportunities while itself gaining access to the college's latest academic and technical advancements. Of particular importance to the College is the fact that the project involves faculty and students from three academic divisions: informatics, the wireless networking group, and nursing. This collaboration is funded through the Natural Sciences and Engineering Research Council of Canada (NSERC) College and Community Innovation Program.

Infonaut was founded in 2003 when, after witnessing the SARS crisis firsthand, two healthcare IT professionals decided to fill a critical gap in the resources available to healthcare planners with a map-based GIS tool that supports fast, information-rich decisions. Infonaut's collaboration with GBC furthers development of unique and innovative Hospital Intelligent Tracking tools, which help hospitals tackle one of the most pressing issues facing hospitals today: the fundamental improvement of patient safety through hospital-acquired infections.

Seneca/Mozilla

At Seneca, an initial project with a small Ontario business looking to cash in on open source technology as a platform for its custom hardware led to an ongoing partnership between Seneca students and Mozilla Corp, developers of the Firefox web browser. As a result, the Seneca Centre for Development of Open Technology (CDOT) was founded. CDOT provides a physical and virtual environment for the development and research of open source products through collaboration with Seneca, the open source community, business, and other institutions. The centre is an integration point for knowledge, education, and relationships within the open source world.

To date, more than 50 students have contributed to Mozilla, the wholly-owned subsidiary of the Mozilla Foundation that co-ordinates the development of Internet-related applications by open source developers. Some of the valuable programming contributions made by students include front-end fixes to Firefox and Thunderbird, as well as web tool improvements.

BCIT/NGRAIN

NGRAIN Corporation, a BC-based company that provides 3-D visualization and simulation solutions for training and maintenance on complex equipment, is a lead donor to BCIT's Technology-Enabled Knowledge (TEK) initiative by providing the institute with software and 3-D models valued at more than \$2 million. BCIT students in automotive, engineering, construction, and aerospace programs, as well as other areas of applied learning, now get to practice complex procedures through 3-D simulations.

In November 2009, BCIT expanded on the original TEK initiative with the launch of The CUBE, supported by a US \$1 million grant from Lockheed Martin and \$380,000 in further software contributions from NGRAIN. This visionary two-year initiative will move the institution's learning and teaching to a new level through further development of NGRAIN interactive 3-D simulations that will continue to enrich curriculum and enhance many elements of the learner experience. The CUBE launch is an example of the Canadian Government creating a policy enabler, in this case Industrial Regional Benefits (IRB) credits, to encourage development of joint industry-academia initiatives—this one benefiting small ICTs.