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Case Study September 2005

The Information Technology Support Associate Program

Keeping IT's Human Resources Pool Filled

This case study looks at the impacts and benefits the Software Human Resource Council's (SHRC's) Information Technology Support Associate (ITSA) program has had and will have on learners, learning systems and businesses in Canada. It explores how the ITSA program has the potential to affect the way students learn about information technology (IT), and how secondary schools teach IT. As well, this case study identifies and considers the many challenges that Sector Councils may face when collaborating with secondary and post-secondary education systems. Finally, it considers the keys to success of the ITSA program as a model of perseverance, adaptation, collaboration and transition.

The information and communications technology (ICT) sector has experienced a great deal of turbulence over the past decade, moving from high-tech boom in the late 1990s to high-tech bust in the early 2000s. However, in the past two years this sector has made a turnaround and shows signs of continued improvement. The Conference Board of Canada's most recent *Industrial Outlook*, for example, notes clear signs of improvement in the industry, such as double-digit growth in real exports and a deceleration in the rate of decline in industry prices.[1]

Canada's ICT industry consists of three sectors: computer and electronic manufacturing, telecommunication services, and computer systems design and related services. In 2004, these three sectors accounted for 4.2 per cent of Canada's gross domestic product (GDP). The telecommunications services sector accounted for the largest share at 57 per cent, followed by computer systems design at 25 per cent, and computer and electronic manufacturing at 18 per cent.[2] The ICT industry employed approximately 474,500 people in the third quarter of 2004.

THE ICT SECTOR—ONWARDS AND UPWARDS

Despite the economic downturn in the early 2000s, the ICT sector remains a powerful driver of economic growth in Canada. ICT permeates our businesses, schools and households, and it has fundamentally changed the way we work, learn, live and play. Recent studies link investments in ICT and productivity growth, and businesses worldwide continue to use ICT to improve their performance.[3]

During the zenith of the high-tech boom, there was an unprecedented demand for IT professionals—the ICT sector accounted for one out of every six new jobs created over the 1990s.[4] Universities, colleges, technology institutes, high schools and private learning institutions all increased their IT- and ICT-related curriculum offerings to address this rise in demand for skilled IT workers. When the bubble burst in 2000, employment in the ICT sector dropped off considerably and continued to decline throughout 2001 and 2002. Post-secondary enrolments in IT programs mirrored the employment trend and have been in decline for the past couple of years—seemingly because the field has lost some of its lustre in the eyes of many Canadians.[5]

THE IT SKILLS GAP ISSUE—PERCEPTION VERSUS REALITY

Although certain segments of the ICT industry continue to struggle, 2004 marked the transition year for the industry as a whole, when real output for the industry surpassed its 2000 peak, with growth reaching a healthy 4.6 per cent.[6] Today, the industry is past the recovery stage and is entering a period of sustainable growth. With this has come a rejuvenated demand from the business community for skilled IT workers.[7] For example, a 2004 study showed that Canadian small and medium-sized enterprises are experiencing difficulties in finding qualified IT professionals, and cited this as a barrier to furthering their e-business presence.[8]

If Canada is to remain competitive globally, it needs a competent and innovative IT workforce.

Nevertheless, the number of individuals either graduating from Canadian IT programs or available to fill required positions within the industry is once again waning. Over the past three years, enrolment in post-secondary ICT programs has declined on average by 50 per cent.[9] In addition, current labour market information shows that while there are approximately 34,000 new IT jobs created every year, colleges and universities are producing only about 8,000 IT graduates per year.[10] If Canada is to remain competitive globally, it needs a competent and innovative IT workforce.

In addition, the IT sector is in need of well-rounded workers—no longer is it good enough to simply be technically inclined. The "next-generation" IT worker must possess comprehensive qualifications, including general IT skills, personal/interpersonal skills and business management skills.[11] Yet numerous post-secondary institutions in Canada continue to offer their technology and science students little in the way of non-technical courses like project management, business communications, marketing and economics.

Today, the major human resources challenges facing the ICT sector include:

- meeting the demand for skilled workers;
- retaining and retraining skilled workers;
- closing the skills and learning gaps between the human resources needs of the IT sector and the educational system; and
- implementing occupational certification and recognition.

THE SOFTWARE HUMAN RESOURCE COUNCIL

The Software Human Resource Council (SHRC) is a not-for-profit organization that works collaboratively with businesses, educational institutions, associations and government to develop the skills and knowledge of students, employees, managers and trainers within the ICT sector.[12] Since 1992, the SHRC has worked hard to attract young people into the IT sector, build a supply of skilled individuals within the IT workforce, and maintain the currency and relevancy of IT-related education, training, and skills development programs in Canada.

This case study focuses on the SHRC's Information Technology Support Associate (ITSA) program—a career awareness and skills development initiative that helps high-school students prepare for careers in IT, and helps meet the growing need for skilled IT workers in every sector of the economy. In particular, this case study identifies:

1. the impacts that the ITSA program has on students, the education system and businesses; and
2. the keys to success and challenges of the ITSA program.

Qualitative and quantitative data used in this study were gathered using a number of research methods, including a review of Sector Council and government literature and a series of in-depth interviews with 13 employers, educators, students, government officials and SHRC staff.[13]

THE INFORMATION TECHNOLOGY SUPPORT ASSOCIATE PROGRAM

The SHRC initially developed the ITSA program with industry support in 2001 in response to a pending skills shortage for entry-level employees in IT-related occupations (e.g., help desk specialists, technical support specialists, network support specialists).[14] First piloted at Riverside Secondary School in British Columbia, the ITSA program offered high school students with a zeal for computers a unique opportunity to explore the possibilities of further education and potential employment in the IT sector.

Software Human Resource Council[1]

The Software Human Resource Council (SHRC) helps build and support human resource capacity in the software sector. Because IT skills are required in most businesses, the SHRC is one of the few Sector Councils that address skills challenges in all industry sectors. The SHRC provides human resources information, services and training for individuals at all stages of their career paths—from those who are high school students to business managers.The SHRC works in partnership with businesses, associations, educational institutions and governments across Canada. With their strategic advice, the SHRC develops programs and services that respond to the human resource needs of the Canadian software sector. SHRC activities include:

- Work Experience—It offers high school students and post-graduate students the opportunity to gain hands-on IT work experience through various programs such as the Information Technology Support Associate Program, the Information Technology Professional Program and the Career Focus program.
- Professional Development—It provides non-technical employees and managers, and IT professionals with seminars and conferences designed to develop their skills and knowledge on technology and management issues.
- Career Awareness—It provides students, educators and others with information about IT careers, such as skills requirements, skills evaluation tools and career planning tools.
- Occupational Skills Profiles—It provides a human resource reference tool for 24 IT job streams that allows occupations to be compared across industries and over time. It also offers online reference tools to help HR managers, IT professionals, economists, educators, students and others identify the skills, knowledge and competencies needed for various IT occupations.
- Labour Market Information—Through surveys, case studies and an expert panel—comprising senior executives from business, government and academia—the SHRC gathers, analyzes, interprets and communicates IT industry trends for IT professionals.

1 For an in-depth overview of SHRC, see: <www.shrc.ca>.

The IT sector is significantly broader than the ICT sector and covers employment in 21 occupations defined in the Statistics Canada National Occupational Classification—Statistics (NOC–S) system.[15] These occupations are found in professional, scientific and technical services industries; manufacturing; public administration; financial and insurance industries; educational services; utilities; and other sectors of the economy. In total, the IT sector employs about 550,000 people, and the unemployment rate is around 3 per cent.[16] It is in this area and in these sorts of occupations that ITSA program graduates will find job opportunities.

The ITSA pilot program has achieved great success as a school-to-school transitions model.

The pilot project found that the majority of graduates used the ITSA program as a stepping stone to further education rather than as a ticket to a job.[17] One reason is that IT employers in Canada place a lot of value on IT-related experience, which ITSA graduates lack.[18] However, a relevant and meaningful educational background is also an important requirement. This fact is clearly noted in the SHRC's 2005 report on the IT labour market in Canada, which points out that only 7.4 per cent of employees in the IT sector reported that their highest level of education was a high school or secondary school diploma.[19]

AN EFFECTIVE SCHOOL-TO-SCHOOL TRANSITIONS PROGRAM

Today, the ITSA program is heralded as a nationally accredited school-transitions program that gives students a head start on their post-secondary education goals by providing them with a foundation of technical, business and essential transferable skills, including industry-recognized certifications.[20]

The ITSA pilot program has achieved great success as a school-to-school transitions model. More than 90 per cent of the graduates have gone on to post-secondary education where they attained, on average, marks that were 16–20 per cent higher than those of their classmates who did not participate in the ITSA program.[21]

Currently, the ITSA program is available in a limited number of schools in British Columbia and New Brunswick. However, the SHRC is working closely with numerous provinces and school districts, and it will soon be rolled out in a number of other provinces. Since its inception four years ago, the program has had 277 graduates: 247 were students from Riverside Secondary, Mount Boucherie Secondary, and Rutland Senior Secondary schools in British Columbia; and 30 were students from Rothesay High-School in New Brunswick.

SHRC Career Awareness and Skills Development Programs

In addition to the ITSA program, the SHRC offers several other programs and services that focus on career awareness and skills development, including:

DiscoverIT.org: An interactive website that offers learners, educators and parents information on learning opportunities, occupations and careers in the IT sector.

Professional Development: Seminars and conferences that shed light on advanced technologies, the management of technologies and team effectiveness.

The Information Technology Professional: An interactive 12-month learning experience for recent university or college graduates from any field of study, and skilled non-technical workers interested in pursuing a career in the IT/informatics sector.

Since its inception in 1995–96, the Information Technology Professional (ITP) program has provided hundreds of graduates (including international students) with strong business and technical skills through a business simulation learning approach. ITP students work together on IT-related projects within a fictitious organization called the Millennium Corporation. Students draw upon their skills and knowledge of business and technology to manage the business and solve reality-based business problems.[1] In addition to operating a company, ITP students participate in a three-month work term to gain valuable real-life work experience. Upon completion of the course, ITP students can obtain their Microsoft Certified Systems Engineer (MCSE) and MCSE Security certification, and apply for the ITP Certificate, a nationally recognized certification granted by the SHRC.[2]

1 Software Human Resource Council, Information Technology Professional Program (ITP). www.shrc.ca/casd/itp/index.html.

2 The ITP program is offered at four colleges: Champlain Regional College, St. Lambert; Willis College of Business and Technology, Ottawa; Humber College, Toronto; and Lambton College of Applied Arts and Technology, Sarnia. For more information on the ITP program, visit: www.itp.ca.

ITSA—A UNIQUE BUSINESS SIMULATION MODEL

The ITSA program is delivered through a business simulation model—a widely accepted pedagogical practice in many business schools, colleges and universities across Canada.[22] Although not as prevalent in high schools, the approach is gaining momentum, and many high schools are now offering business simulation as part of their curriculum.[23] The SHRC is leading the way in developing IT skills in Canadian high school students.

Business simulation typically involves teams of students running a fictitious company. It provides a risk-free environment for students to apply their knowledge, skills and abilities in managing a business. This hands-on practical learning approach teaches students to develop business strategies, set goals, make business decisions and improve their interpersonal skills through teamwork.

A CUSTOMIZED IT LEARNING FRAMEWORK

The ITSA business simulation model is a two-year program tailored to meet the needs of grades 11 and 12 high school students interested in possible careers in IT. In addition to the core ITSA program, which focuses on computers and networking, students can also enhance their learning by concentrating on database technology skills, or privacy and security networking skills—two of the most popular new fields in IT. The content of each of these program concentrations is as follows.

ITSA PROGRAM CONCENTRATIONS

1. *Computers and Networking* focuses on: common desktop software application programs; resolving software-related problems; and maintaining, repairing and configuring PC hardware and simple network systems.
2. *Database Technology* focuses on: how IT database software can help an organization achieve its goals and become more productive; and understanding the concepts involved in designing, using and accessing home- and small-business databases.
3. *Security and Privacy Networking* focuses on: the fundamentals of hardware and software configurations needed to provide a secure IT environment; analyzing PCs and home networks for security threats; and taking corrective action to overcome any networking vulnerabilities.

ITSA CLASSROOM WORK

ITSA classroom work involves students working in teams and managing their own computer sales/service business during regular class time. During their two

years in the program, students undertake a number of projects that cover the educational aims, learning outcomes and performance measurements established by the SHRC and industry. The ITSA program has established seven broad educational aims, 22 learning outcomes and 225 elements of performance. These provide the framework that ministries of education, school boards, schools and educators follow when developing the ITSA curriculum.

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The overarching educational aims of the ITSA program include the following:

1. Identifying and exploring career opportunities within the IT field, and developing a personalized career plan.
2. Applying knowledge of common desktop software application programs to resolve IT- and business-related problems.
3. Providing technical support through research and PC maintenance, repair and configuration.
4. Communicating clearly in written, spoken and visual formats to suit the needs of the audience.
5. Understanding how IT supports an organization in achieving its goals.
6. Acquiring an understanding of the workplace environment and developing employability skills and attitudes to plan future life/work roles.
7. Incorporating technology into the process of lifelong learning through further education and workplace experience.

A FRAMEWORK FOR IMPLEMENTATION

The ITSA framework developed by the SHRC and industry sets out a program for educators and students to follow in which two projects are completed in Grade 11 and two more are completed in Grade 12.[24]

The four projects are:[25]

1. Exploring Business Opportunities in the IT Field (Grade 11). In this project, students are introduced to the business simulation model, discuss the components of a business, and form their own businesses.

2. Business Operations—The Computer Store (Grade 11). At this stage, students are working on the A+ component of the ITSA curriculum. This project reinforces the computer hardware/software skills training by having students assemble, test, troubleshoot and repair the computer systems being used in their business simulation model.

3. Moving into Business and Home Networking (Grade 12). By this time, students will have gained some co-op experience or industry-related summer employment (see next section, below). In this project, students include simple networking as part of their services within the business simulation model.

4. Networking in the Corporate World (Grade 12). In this final simulation project component of the ITSA program, students should be completing the Network+ curriculum. This project has students work on more complex network support, installation and design.

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ITSA WORK EXPERIENCE

In addition to completing the four projects, students are also expected to participate in summer work terms—usually through an apprenticeship or co-op program. The intent is to provide students with an opportunity to further their business and technical skills development and gain a solid understanding of workplace realities. The work experience component also helps students fulfill the requirements needed to achieve their ITSA National Certification, which calls for 440 hours of IT-related work experience.

CERTIFICATION

The ITSA program prepares students for a number of industry-recognized certifications, including A+, Network+, and the ITSA National Certification.

Students must write exams to become A+- and Network+-certified. The A+ designation focuses on hardware and operating systems, and Network+ focuses

on network administration. These technical certifications were developed by the Computing Technology Industry Association (CompTIA), an association representing IT professionals worldwide. This association provides industry standards, professional development and education and business solutions for the IT sector.[26] Consequently, the A+ and Network+ certifications are recognized around the world by the IT industry.

To acquire ITSA National Certification, students must:

- successfully complete all ITSA project work;
- acquire 440 hours of relevant work experience; and
- obtain A+ and Network+ certification.

A+ Certification
A+ certification is internationally recognized by the IT industry. It was first introduced in 1993 to demonstrate individuals' knowledge and competency in hardware and operating system technologies, such as installation, configuration, diagnostics, preventive maintenance and basic networking. To become certified, individuals must pass two exams—the Core Hardware exam (PC maintenance) and the Operating Systems Technologies exam (PC operating systems). Currently there are more than 500,000 individuals who are A+-certified.

Network+ Certification
Started in 1997, Network+ is another highly regarded and recognized certification. It builds on the foundation skills achieved through the A+ certification—and as such, delivery partners recommend individuals acquire their A+ certification before taking Network+. Network+ validates individuals' knowledge about the features and functions of networking components. It also demonstrates the skills and knowledge needed to install, configure and troubleshoot basic networking hardware, protocols, standards, media and topologies, implementation and support. To become Network+-certified, individuals must pass an exam that also covers new technologies such as wireless networking and gigabit Ethernet. To date, more than 150,000 people are Network+-certified.

BENEFITS TO STUDENTS

Upon completion of the ITSA program, graduates have a secondary school diploma, combined with:[27]

- IT and business/entrepreneurial skills;
- essential workplace skills;
- exposure to, and an increased awareness of, the IT field;
- IT-relevant work experience;
- the knowledge and competency to successfully acquire the industry-recognized A+ and Network+ certifications;
- the nationally recognized ITSA credential; and
- advanced standing and/or credit towards post-secondary programs.

THE ACQUISITION OF RELEVANT AND RECOGNIZED SKILLS

The ITSA program's business simulation model places an important emphasis on students acquiring and developing many essential workplace skills, such as analytical skills communication skills and time management skills. Many employers consider these personal and interpersonal skills to be of significant importance to their company's long-term success and, as such, look for them when hiring new IT employees. Much of the intrinsic value of the ITSA program resides in this blended learning approach of technical and non-technical skills development.

One former student now working in the IT sector noted in an interview for this case study that the ITSA program was different from any other high school course he had ever taken because it had provided him with the opportunity to be creative and to take ownership of his learning: "The open-learning concept of the ITSA program gave me as close to a real-world IT business experience as possible. There's nothing like it out there."

High school students who responded to a paper-based survey for this study noted that the activities and outcomes that they appreciated most about the ITSA program included: the hands-on learning approach; the team-based learning style; the unique curriculum; the use of real-world business-related problems; and the fact that it helped them get into college. As well, survey respondents noted that the ITSA program and accompanying certification helped them get into the college of their choice with preferred standing.[28]

BENEFITS TO THE EDUCATION SYSTEM

The ITSA program offers the secondary school system an opportunity to deliver engaging, industry-supported learning through a unique pedagogy. A high school teacher interviewed for this study noted that the ITSA program helps students learn how to follow directions, take initiative, function independently, work in teams, communicate clearly and solve problems.

The Toronto District School Board (TDSB), for example, sees value in the program as a framework and learning pathway for those students within its 124 secondary schools who are not going on to post-secondary graduate studies. The program, according

to one TDSB employee interviewed for this case study, gives students a clear sense of a possible career to follow. It also shows students how they will be recognized and credentialed, above and beyond the school diploma—specifically through the ITSA certification and A+ and Network+ certifications.[29]

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According to one Alberta educator interviewed for this case study, "The ITSA program is part of the quiet evolution going on in the world of education. It has the potential to make the steps from high school to post-secondary education, or the workplace, a much smoother transition for students, as ITSA lets students take ownership of their futures and choose which learning and career pathways they want to take."

KEYS TO SUCCESS

1. DEVELOPED IN COLLABORATION WITH GOVERNMENT, INDUSTRY AND EDUCATION

The ITSA program was developed by the SHRC in consultation with the IT industry and the education system in an effort to meet current and future human resource needs. Students benefit from an experiential learning program that gives them industry- and education-recognized credentials. Ultimately, it gives students an advantage as they pursue further studies or opportunities in the ICT labour market.

ITSA National Steering Committee

The SHRC recognizes the value of collaboration and has established an ITSA National Steering Committee to guide and inform the ongoing development, refinement and implementation of the ITSA program throughout the country.

The Steering Committee typically meets twice per year to review the progress of the ITSA program and to assist the SHRC in addressing the political, bureaucratic and regional issues that the program faces. The Committee is made up of representatives from the business community, educational institutions, provincial ministries of education, school boards/districts and the Government of Canada.[30] Without the stewardship of the National Steering Committee, the ITSA program would not be where it is today.

2. ITSA PROGRAM PARTNERS

By establishing agreements with other partners and vendors, the SHRC has been able to create a learning and skills development program that is recognized by industry and the education system across many regions of Canada. In addition to the ongoing financial support of Human Resources and Skills Development Canada, three key partners have made the ITSA program possible: the public education system; CompTIA; and Industry Canada.

Ministries of Education and School Districts

The SHRC brings to the learning table an exceptional amount of knowledge about the ICT industry, labour market insights, credibility and links to the industry. What it cannot do, however, is write curricula. The schools, school boards and ministries of education that have partnered with the Sector Council bring with them the expertise, ability and credibility to match up the ITSA program goals and objectives with bona fide learning curricula.

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CompTIA

The SHRC's agreement with CompTIA provides free A+ and Network+ certification exams for up to four high school teachers, and a 60 per cent discount for students wanting to take these exams.[31] In return, schools are required to purchase a CompTIA education membership at a yearly rate of CDN$240.75.

Industry Canada—Computers for Schools

The partnership agreement with Industry Canada, through its Computers for Schools program, assists schools with their computer equipment needs. Schools delivering the ITSA program receive up to 50 computers with a minimum Pentium II processing capacity, and peripheral equipment, as available. Although the equipment offered through the Computers for Schools

program is not leading-edge and may not address all of the IT-project needs of a school, it does help schools address the challenge of matching technology requirements with intended learning outcomes.[32]

Association of Canadian Community Colleges (ACCC)

The SHRC works closely with the Association of Canadian Community Colleges, National Council of Information Technology Deans, and its IT Affinity Group. These groups bring together individual colleges with an interest in IT and IT-related studies to discuss common interests, ideas, challenges, best practices, effective programs, advocacy concerns and recent developments. The IT Affinity Group consists of more than 70 colleges and CEGEPS interested in IT and IT-related learning.

The SHRC recently presented the ITSA program to the National Council of IT Deans—representing approximately 90 colleges—who committed in principle to support the ITSA program and recognize it with advanced standing, college credit or guaranteed placement, depending on the province or institution involved. Furthermore, some colleges have taken the initiative of contacting the school boards within their regions to highlight the benefits of the ITSA program.

3. ADVANCED STANDING IN POST-SECONDARY EDUCATION INSTITUTIONS

ITSA graduates currently receive advanced standing in an IT-related post-secondary program at two community colleges: the computer systems service technician program at the British Columbia Institute of Technology (BCIT); and the network and telecommunications engineering technologist diploma program at Okanagan University College (OUC).

The SHRC is currently negotiating the development of articulation agreements with post-secondary institutions across Canada to ensure that ITSA graduates receive recognition for their learning, through either advanced standing or guaranteed placements in a variety of computer-related courses and programs.

4. SLOW AND STEADY: BUILDING CAPACITY ONE JURISDICTION AT A TIME

Provinces, territories and school boards interested in delivering the ITSA program are required to sign licence agreements with the SHRC, allowing the licensees to deliver the ITSA program within their jurisdictions for as long as they want. The cost of an ITSA licence is CDN$5,000 for a school board/district or CDN$25,000 for a provincial site licence.

Today, four years after the initial launch and fine-tuning of the program, the ITSA program is on the cusp of becoming a truly pan-Canadian IT skills development program recognized by both industry and post-secondary education providers. The SHRC cannot do it alone, and needs the support of industry and employers to build awareness and advocacy for the program. The SHRC estimates that by 2006 there will be between 500 and 1,000 new entrants into the ITSA program across Canada.

It has not been an easy journey. Since education is a provincial responsibility, the SHRC has had to build relationships with each of the country's 13 provincial and territorial ministries of education. Many provinces referred the decision to use the ITSA program to their school boards. Since there are 489 school boards in Canada—representing 3,400 secondary schools—the task of reaching each of them was and is daunting.[33] Yet significant progress has been made.

The SHRC cannot do it alone, and needs the support of industry and employers to build awareness and advocacy for the program.

The SHRC has strategically targeted its efforts on those provinces and regions in Canada with the highest percentage of IT workers. Students, teachers, schools and school boards, colleges and businesses in these areas are the ones most likely to be interested in and support the ITSA program. The provinces and regions that the SHRC is focusing on are: Ontario (Kitchener-Waterloo, Toronto and Ottawa regions); Quebec (Gatineau, Montréal, and Québec City regions), and Alberta (Edmonton and Calgary regions).[34]

Below is a brief overview of the initiatives and progress being made by SHRC and its stakeholders to get the ITSA program up and running in educational jurisdictions across the country.

Ontario—A Career and Learner Pathways Perspective

At the direction of the Ontario Ministry of Education, the SHRC was required to approach each of the province's 106 school boards to see if any were interested in implementing the ITSA program. Rather than attempt to cover all of these boards, the SHRC implemented a

plan to partner with the Toronto District School Board —the largest school board in Canada—and develop both an Ontario ITSA delivery model and the required curriculum. The second phase of the plan would then see the SHRC approach other school boards with the model and curriculum in place.

The SHRC was required to approach Ontario school boards to see whether any were interested in implementing the ITSA program.

To date, the SHRC has made presentations to 30 school boards in southern Ontario, with quite a bit of success. ITSA licence agreements have been signed with seven school boards: Toronto District; Thames Valley District; Ottawa-Carleton District; Greater Essex District; Upper Canada District; Upper Grand District; and Algonquin and Lakeshore Catholic District.

In northern Ontario, presentations have been made to 21 school boards, and 19 of them have expressed interest. However, these boards do not have the time to implement the program and are deferring any decisions to another year. As well, there is some trepidation from some of these boards about signing on to the program, because of the investment in time, effort and resources needed to develop the proper curriculum.

Quebec—A Workforce Skills Perspective

The SHRC faces the same challenges and hurdles in Quebec that it does in Ontario—how to penetrate the public education system in an efficient and effective manner, given the provincial government's reluctance to back the program.

The SHRC faces the same challenges in Quebec that it does in Ontario—the provincial government's reluctance to back the program.

Individual school boards are being approached. As well, given the federal–provincial sensitivities when it comes to training and learning development, the program is being marketed more as a workforce strategy than a Government of Canada skills program.[35]

Alberta—Learner Pathways Perspective

The Alberta experience is different. Initially, the province was reluctant to support the program, and instructed the SHRC to speak with individual school boards. The interest from the school boards was quite strong, with 67 of them considering offering the program within their schools. Alberta Education then purchased a provincial ITSA licence and is now working with a committee made up of educators, curriculum writers and others to develop its delivery model and the ITSA curriculum and integrate it into the province's Career and Technology Studies (CTS) pathway. As well, articulation agreements are being negotiated with colleges across the province so students can go to any college with the ITSA certification and get either advanced standing or preferred entrance.

British Columbia—Industry Training and Trades Perspective

British Columbia is where the ITSA program took root. Between 1999 and 2000, the provincial government showed quite a bit of interest in developing school-to-work transition programs. The ITSA program fit the bill for the burgeoning IT sector. In partnership with the Ministry of Education and the Industry Training Apprenticeship Commission (ITAC), the SHRC implemented a pilot ITSA project, which got a lot of publicity and support. In 2001, the political and economic environment drastically changed. A new government was elected, the ICT sector faltered, ITAC was decommissioned and work on transitions programs stopped. The ITSA program was left to function on its own.

To regain its sheen in B.C., the ITSA program must garner the public support and backing of local industry.

In 2004, the government launched its new Industry Training Authority (ITA-BC), where industry trades in high demand, like construction and home building, have received much of the attention and support. The ICT sector was no longer seen as being a high-demand industry, and the ITSA program—although still part of the government's trades training program—receives no funding and is in a holding stage waiting for review.

To regain its sheen in B.C., the ITSA program must garner the public support and backing of local industry. A government employee interviewed for this case study noted that "Because ICT is not a recognized trade in the province, the IT industry must be more proactive in lobbying the government and tell them that they need IT professionals and programs like ITSA." The same government employee also noted the importance of ITSA developing and promoting its industry-recognized and industry-supported certificate.

ONE PROGRAM, MANY DIFFERENT DELIVERY APPROACHES

It is clear from the above analysis that the ITSA program has been mindful of the different jurisdictions within which it operates, and respectful of the integrity of their education systems. Although it continues to be a "hard sell," according to one education consultant interviewed for this case study, it is a worthy initiative. "Curriculums do not change easily—so seeing so much interest and work going on to integrate the ITSA program into hundreds of school curriculums in Ontario, Alberta, British Columbia and New Brunswick speaks volumes about the value of the program." The ITSA program needs:

- champions in the classroom—dedicated and compassionate teachers knowledgeable in business/entrepreneurial and networking skills;[36]
- a champion in the school—a principal or vice-principal who appreciates the value and design of the program's experiential learning approach; and
- a champion at the school board/district level—a superintendent or commissioner who is willing to step out, and who supports the program and its unique learning model.

CHALLENGES AND NEXT STEPS

NEED FOR THE CONTINUED PROMOTION AND SUPPORT OF THE ITSA PROGRAM

The ITSA program is in the midst of a growth spurt and needs the continued support of government, industry, the education system and other stakeholders to succeed and become a part of the learning fabric within Canada's secondary school system.

The SHRC will continue to leverage its standing as a national not-for-profit organization to build awareness and support for the program by meeting with ministries of education, school boards and districts, industry representatives and others. Similarly, it is equally important that those businesses, ministries of education, school districts and boards that currently support the program stand up and do what they can to raise awareness and interest in the ITSA program.

The ITSA program is in the midst of a growth spurt and needs the continued support of government, industry, the education system and other stakeholders.

An employer in British Columbia interviewed for this case study had never heard of the program. However, when he was informed of the learning outcomes and the business simulation model used to teach the curriculum, he was interested in learning more about it and the graduates it was producing. As it happened, he had an ITSA graduate on staff. Moving forward, the SHRC might want to consider creating a database of ITSA graduates and promote them, and the program, to local businesses. Interestingly, the employer described above noted that if he hired any more students coming out of high school, either part-time or full-time, he would look for the ITSA qualification.

The future looks bright for the ITSA program as it rolls out in Ontario and Alberta.

One of the promotional ideas for the program raised at the June 2005 ITSA National Steering Committee meeting was to develop a community engagement process involving businesses, chambers of commerce, industry representatives, economic development officers, schools, parents and teachers, where key stakeholders would be introduced to the value and potential impact of the ITSA program.

The ITSA program, and in particular its learning and skills development outcomes, including the ITSA certification, needs to be recognized and valued both locally and nationally by industry and the education system. Gaining this support takes time but produces results. The future looks bright for the ITSA program as it rolls out in Ontario and Alberta.

THE POSSIBILITY OF A TIERED ITSA CREDENTIAL

Another suggestion that arose from discussions at the June 2005 ITSA National Steering Committee was to consider implementing a tiered credentialing system for the ITSA program, in which a suite of diplomas and certificates would be issued for different levels of software, operating systems and networking competence—with the ITSA certificate being the pinnacle of achievement.[37]

The ITSA program needs to be recognized and valued both locally and nationally by industry and the education system.

A Level 1 ITSA diploma, for example, might recognize basic software knowledge and some fundamental computer troubleshooting techniques; Level 2 might recognize an individual's capacity to work with more complex operating systems and networking applications, along with a level of work experience; Level 3 might incorporate the A+ and Network+ designations, plus additional layers of understanding and experience in networking applications; and Level 4 would meet all of the requirements of the ITSA certification. In this way, students who did not complete the ITSA program in its entirety would still be recognized for the IT knowledge and skills acquired along the way.[38]

CONCLUSION

The ITSA program offers students the opportunity to engage in hands-on, experiential IT learning, and allows them to make meaningful connections between what they are learning and how it might apply to their future studies or work. As a result, students become empowered learners, are able to showcase their talents, discover new skills, and stretch their imaginations and abilities, while learning about the possibilities of employment in the IT sector. In short, the ITSA program acts as a proactive bridge between secondary and post-secondary education and employment in the IT sector.

The months ahead look to be the breakthrough period for the ITSA program.

The SHRC is ramping up its promotion of the ITSA certification as a career and development strategy. As one ITSA national steering committee member noted: "ITSA is recognized by a number of big industry players, but more small and medium-sized enterprises must become aware of what it offers. Once the program gets a stronger foothold in a number of school boards/districts, it will excel."

The months ahead look to be the breakthrough period for the ITSA program, as more than 30 additional school boards in Ontario and Alberta implement the program and three more provinces look at adopting the province-wide approach to getting ITSA into the classroom. As well, a national approach to the community college articulation agreement process is about to be signed.

To leverage this momentum, the SHRC is spearheading a national engagement strategy for all of the provincial ministries of education in October 2005. Finally, a partnership with a major national employer with regional employment opportunities has been developed to further demonstrate to students the value and opportunities associated with the ITSA program.

Through these initiatives, students who participate in the ITSA business simulation model curricula will find a post-secondary education community and an IT industry that is supportive of the program and the skilled and motivated individuals who come out of it.

1 Michael Burt, *Canada's Information Technology and Communications Industry: Industrial Outlook* (Ottawa: The Conference Board of Canada, Spring 2005), pp. 1–2.

2 Ibid, p. ii.

3 Studies that link ICT investments to productivity growth include: Stephen Oliner and Daniel Sichel, *The Resurgence of Growth in the Late 1990s: Is Information Technology the Story?* (Washington: Federal Reserve Board, 2000); Pedro Antunes, Mario Lefebvre, Jane McIntyre and Pascal Cormier, *IT and the New Economy: The Impact of Information Technology on Labour Productivity Growth* (Ottawa: The Conference Board of Canada, 2000); and Dale Jorgenson and Kevin Stiroh, *Raising the Speed Limit: U.S. Economic Growth in the Information Age* (Washington: Brookings Papers on Economic Activity, 2000).

4 Desmond Beckstead and W. Mark Brown, *An Anatomy of Growth and Decline: High-tech Industries Through the Boom and Bust Years, 1997–03* (Ottawa: Statistics Canada, 2005), p. 1. The shortage of skilled IT professionals reached critical proportions in the late 1990s. The skills shortage in the sector became a prominent issue because of the rapid rise of the IT sector in the Canadian and world economies and because of its public prominence on the world stock market.

5 SHRC Expert Panel, *Canada's Information Technology Labour Market 2005: Issues and Options*. (June 2005), p. 1. www.shrc.ca/lmi/expert_panel/index.html.

6 Ibid, p. 1.

7 The Conference Board's 2005 *ICT Industrial Outlook*, for example, forecasts year-over-year increases in ICT sector employment from the second quarter in 2004 (1.1 per cent) through to the fourth quarter of 2005 (0.4 per cent). For more details, see: *ICT Industrial Outlook*. (The Conference Board of Canada, Spring 2005), p. 13.

8 Canadian e-Business Initiative (CeBI), *Fast Forward 5.0: Making Connectivity Work for Canada* (Ottawa: CeBI, 2004), p. 17.

9 *Proposed Action Plan Resulting from a National IT HR Forum*, Prepared by the Association of Canadian Community Colleges and the Software Human Resource Council, 2005.

10 The Information Technology Support Associate Program held a Steering Committee meeting on June 20, 2005. The number quoted is from the Committee meeting's minutes.

11 *Canada's Information Technology Labour Market 2005: Issues and Options*, p. 4.

12 The SHRC's Board of Directors includes: Alberta Research Council, University of Calgary, CGI Information Systems & Management Consultants Inc., Association of Canadian Community Colleges, Association of Professional Engineers of Ontario, Ken Chapman Professional Services Inc., Jamie Darch & Associates Inc., TechnoCompétences, GINI University Services Inc. (Dalhousie University), Cisco Systems Canada, and Tri-Lan Internetwork Ltd. For more information, see: www.shrc.ca/about/index.html.

13 Information for this case study was also collected at the June 2005 meeting of the ITSA National Steering Committee (NSC) meeting, held in Aylmer, Quebec. The ITSA NSC meeting was attended by more than 20 business, government and education representatives.

14 The program was developed based on:
- consultation with the IT industry and SHRC partner groups;
- curriculum development defining educational aims, learning outcomes and elements of performance;
- skills identification by 800 IT employers and subsequent validation by four industry focus groups; and
- pilot testing in two communities.

15 NOC-S IT occupations include, for example, computer and information system manager, computer engineer, database administrator, software engineer, web technician, technical writer. For details, see the Statistics Canada website: http://www.statcan.ca/english/Subjects/Standard/soc/2001/nocs01-menu.htm.

16 Each month the SHRC provides monthly updates on Statistics Canada's Labour Force Survey for information technology occupations. For details, see: http://www.shrc.ca/lmi/lfs/data.html.

17 The reasons for this, which were raised in discussions with businesses, educators and governments include:
- students always had it in mind to pursue post-secondary education upon graduating from high school; or
- businesses remained hesitant to hire, on a full-time basis, individuals coming from high school with little real-world working experience.

18 In a national survey of 5,028 employers, an overwhelming majority regarded experience as more important than education across all IT industries and occupations. See: Morely Gunderson, Lee Jacobs and François Vaillancourt, *The IT Labour Market in Canada: Results from the National Survey of IT Occupations* (Ottawa: Software Human Resource Council, April 2005), p. 58. www.shrc.ca/lmi/surveys/national_survey.html.

19 5,183 employees responded to the survey. For details, see: Gunderson, Jacobs and Vaillancourt, *The IT Labour Market in Canada*, p. 72.

20 The ITSA program prepares students to write the A+ certification exams on PC maintenance and PC operating systems; and the Network+ certification exams on media and topologies, protocols and standards, network implementation, and network support.

21 The ITSA brochure is available at www.shrc.ca/casd/career_orderform.html.

22 Post-secondary institutions that offer business simulation as a learning approach include: University of Ottawa, University of Toronto, Wilfrid Laurier University, Northwest Community College, Keyano College and many others.

23 In addition to in-class business simulation models, high school students also participate in business simulation competitions. For example, Carleton University hosts an annual business competition for Ontario high school students, while the University of New Brunswick holds a similar competition for high school students in the Maritime provinces.

24 The four topics and curriculum outlined in the ITSA program are frameworks for teachers to use as a guide—they are not prescriptive. Teachers may modify the projects and use different scenarios to suit the needs of their students and local/regional job market. As well, teachers may decide to use a different instructional methodology than the business simulation model. The SHRC has also developed a mentorship model. For details, see: Sheila Simard and Steven Rauh, *ITSA Business Mentorship Model* (Ottawa: SHRC, August 31, 2003). www.shrc.ca/casd/itsa/resources.html.

25 SHRC, *Information Technology Support Associate Program* (Ottawa: SHRC, 2003–04).

26 For further information about CompTIA, visit their website: www.comtia.org.

27 SHRC, ITSA Brochure, *Jump-Start Your IT Career*. www.shrc.ca/casd/career_orderform.html.

28 The colleges referred to are the British Columbia Institute of Technology and Okanagan University College.

29 It is essential that the industry recognize the ITSA certification as a meaningful and sought-after credential; if it doesn't, the learning outcomes of the ITSA program will have far less value.

30 The ITSA National Steering Committee includes representation from: Newfoundland and Labrador Department of Education, New Brunswick Department of Education, Northern Alberta Institute of Technology, JED New Media Inc., Nortel Networks, Manitoba Department of Education—Advanced Education and Training, FreeBalance Inc., Alberta Advanced Education, Ottawa-Carleton District School Board, TechnoCompétences, Precision Management Catalysts Ltd., Industry Canada, Human Resources and Skills Development Canada, and numerous education consultants.

31 To receive this benefit, schools are required to purchase a CompTIA education membership at a yearly rate of CDN$240.75. One of the key recommendations from the ITSA pilot projects was that the IT educators delivering the program should be A+- and Network+- certified; offering free certification to four teachers is a significant savings for schools and school boards and adds to the integrity of the ITSA program.

32 There is an opportunity for the ICT industry to be proactive and support the SHRC by providing leading-edge equipment to high schools for the ITSA program.

33 For information on the Canadian education system, visit: www.cdnsba.org/education_in_canada.php. The number of schools is based on the 2003–04 year, and comes from Statistics Canada, at: www.statcan.ca/Daily/English/040610/d040610b.htm.

34 From Gunderson, Jacobs and Vaillancourt, *The IT Labour Market*, pp. 33–36; and a presentation to the ITSA National Steering Committee Meeting, June 20, 2005, by Denyce Daikun, Past Director of Career Awareness and Skills Development, SHRC.

35 TECHNOCompétences, a Quebec-based organization that supports and promotes the development of labour and employment in the ICT industry, was contracted by SHRC to develop and implement an ITSA strategy in Quebec.

36 Based on evaluations of the pilot programs in British Columbia, the SHRC recommends that schools delivering the ITSA program should have two teachers—one with business knowledge and the other with IT knowledge—work together to deliver the program. The IT teacher should be A+- and Network+- certified.

37 Not all individuals enrolled in the ITSA program may go on to post-secondary education or careers with a focus on IT. However, given that IT is prevalent across all industries, most occupations and throughout the education system, there is value in recognizing individuals for their accomplishments in IT training.

38 This tiered credential is something that the SHRC might want to consider in the future, after establishing a foothold in the secondary school system with the ITSA program. A tiered system comes with its own merits and challenges and is something that the SHRC has had experience with through its ITP program. One concern is the difficulty in marketing a tiered system of credentials to industry and other stakeholders during the early stages of marketing, when a simpler and more consistent message about the value and skill sets that graduates acquire is best.

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By *Natalie Gagnon* and *Douglas Watt*

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