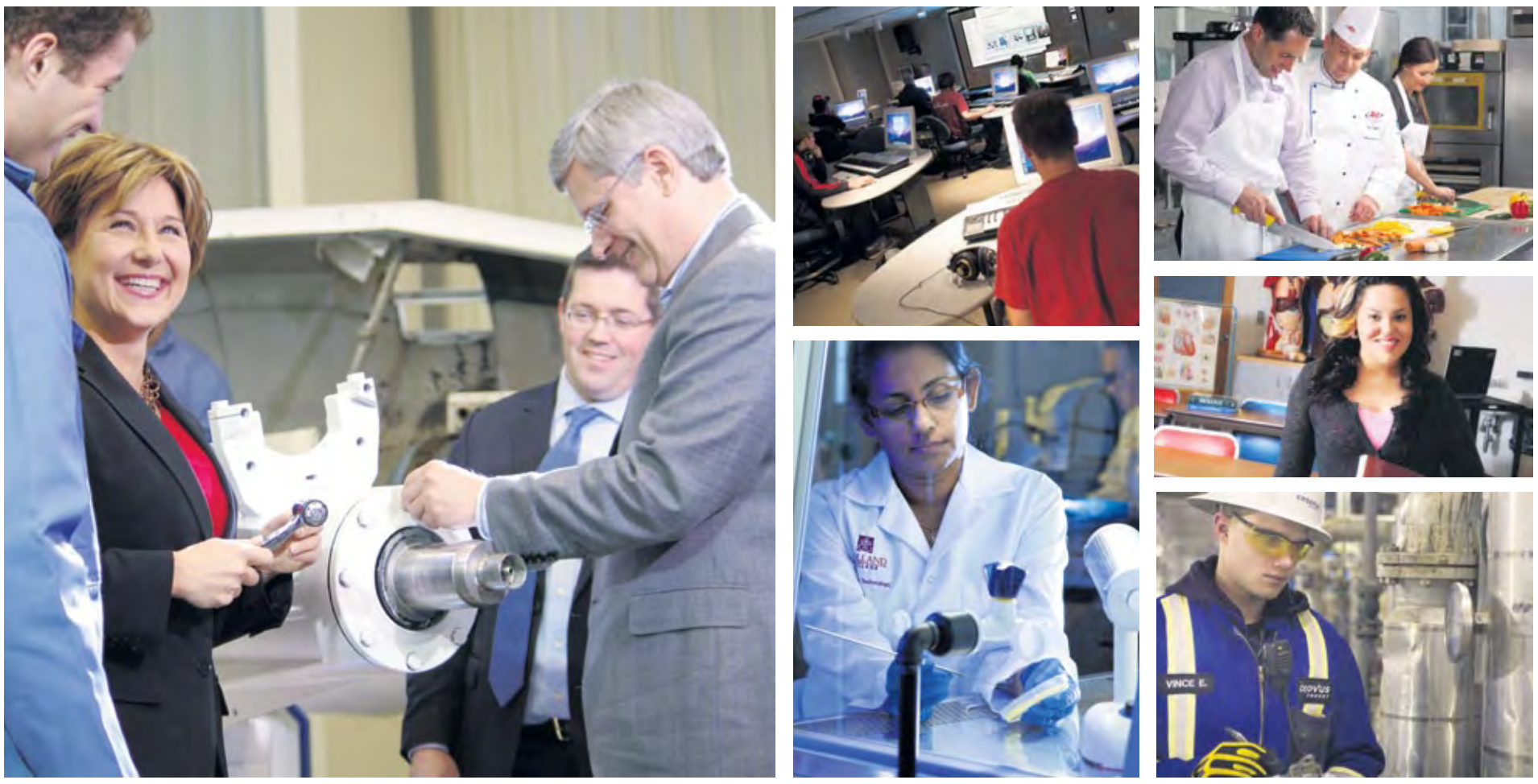
Special

Canada's colleges and institutes



Clockwise from left: Prime Minister Stephen Harper and B.C. Premier Christy Clark at the opening of Northern Lights College's Energy House in Dawson Creek; Fanshawe College; SAIT Polytechnic; Saskatchewan Institute of Applied Science and Technology; Northern Lakes College; Holland College. SUPPLIED

Leading academics and industry bodies warning of a future plagued by recession- or even Depression-level unemployment **are finding new hope in programs aimed at bridging Canada's skills gap**

Demographers have long predicted a massive skills shortage as Canada's baby boomers retire, with just one Canadian worker aged 24 to 35 available to replace every three workers aged 55 and older.

Last year, the Canadian Chamber of Commerce called Canada's labour shortage "desperate." It predicted a shortfall of 163,000 workers in construction, 130,000 workers in oil and gas, 60,000 workers in nursing, 37,000 workers in trucking, 22,000 workers in the hotel industry and 10,000 workers in the steel trades over the next decade.

But in the report *People Without Jobs, Jobs Without People*, former Seneca College president Rick Miner mapped an even bleaker future, which he described as "the intersection of two megatrends: an aging population and an emerging knowledge economy."

In the future foretold by Dr. Miner, as many as 1.8 million jobs may go unfilled by 2031 in Ontario alone, alongside recession- or even Depression-level unemployment.

Today, says Don Lovisa, president of Durham College, "We have hundreds of thousands of people unemployed across this country, without the skills employers are looking for. Our federal government is introducing new policies that will allow more immigration of trades professionals, but we must train a lot more Canadians as well."

Ann Buller, chair of the Association of Canadian Community Colleges (ACCC) and president of Centennial College, agrees. "We know that about 70 per cent of new jobs are going to require post-secondary education, while only about 42 per cent of working-age Canadians have the kind of skills they need to get and to keep gainful employment."

In response, Canada's colleges, institutes and polytechnics are collaborating with industry and government on innovative initiatives aimed at bridging the skills gap.

Durham College, in partnership with the University of Ontario Institute of Technology, works with Ontario Power Generation to plan programs and curriculum based on its employment and skills needs. The college is also introducing a new Centre for Food, built on the "field-to-fork" concept, to contribute to the growing food production and culinary/agri-tourism sector. "As the economy diversifies, we're introducing new programs to keep up with the workforce needs of the region," says Mr. Lovisa.

Bridging the skills gaps also requires making training and education accessible to each and every Canadian, stresses Ms. Buller. "Our members are always working to find pathways for more youth and to increase participation rates. We want to help our Aboriginal Peoples develop greater faith in our post-secondary institutions and engage in higher numbers, and to make post-secondary education more accessible to new Canadians and people who are living with disabilities. There is tremendous work being done on that front."

Canadian post-secondary institutions are also developing programing to help older individuals "re-skill," in order to achieve full employment in a swiftly changing job market, she notes. "The days in which a first degree or diploma guaranteed you a job for life are long gone, but it is still a challenge to say 'welcome back to school' to a 44-year-old. We're working to help ensure older learners succeed, and that there are pathways between provinces, so that education completed in Nova Scotia has value in Alberta, for example."

The composition of the student body at Centennial College is an illustration of these trends. About 36 per cent of new Canadian students have already attended university or college, while about 45 per cent are the first in their family to attend a post-secondary institution. More than 20,000 people have completed ACCC's Immigrant Integration Program, which is delivered to immigrants in their home countries to prepare them to succeed in Canada's job market once they arrive here.

Applied research initiatives are also strengthening the partnership between ACCC members and industry. "Last year, there were more than 4,500 companies that partnered with colleges across the country, in 447 different areas of research. The applied research being done by our members has a direct impact on the economy, and helps our students learn new, sophisticated skills," reports Ms. Buller.

Rising enrolments and healthy post-graduate employment statistics prove that Canadians are recognizing the value delivered by colleges and polytechnic institutes, says Marilyn Luscombe, president of New Brunswick Community College.

At the college, for example, the latest survey indicated that 90 per cent of students were employed within the first year after graduation, with 94 per cent of those finding jobs in the province. The college is also contributing to New Brunswick's economy by attracting an increasing number of international students.

"We are doing a lot of things right," Ms. Luscombe says, although she adds that "there are no simplistic solutions. We know that addressing the skills gap requires a continued collaborative effort between employers and the education system going forward."

ABOUT ACCC

The Association of Canadian Community Colleges (ACCC) is the national voice for 129 publicly funded colleges and institutes with campuses in 1,000 communities, serving 1,500,000 full- and part-time learners. Ninety per cent of their students are employed within six months of graduation. Their third showcase, Increasing Productivity Through Incremental Innovation - Colleges, Institutes and Polytechnics: Applied Research for Economic and Social Development, is available at accc.ca.

"The applied research being done by our members has a direct impact on the economy, and helps our students learn new, sophisticated skills."

Ann Buller
is chair of the Association of Canadian Community Colleges and president of Centennial College

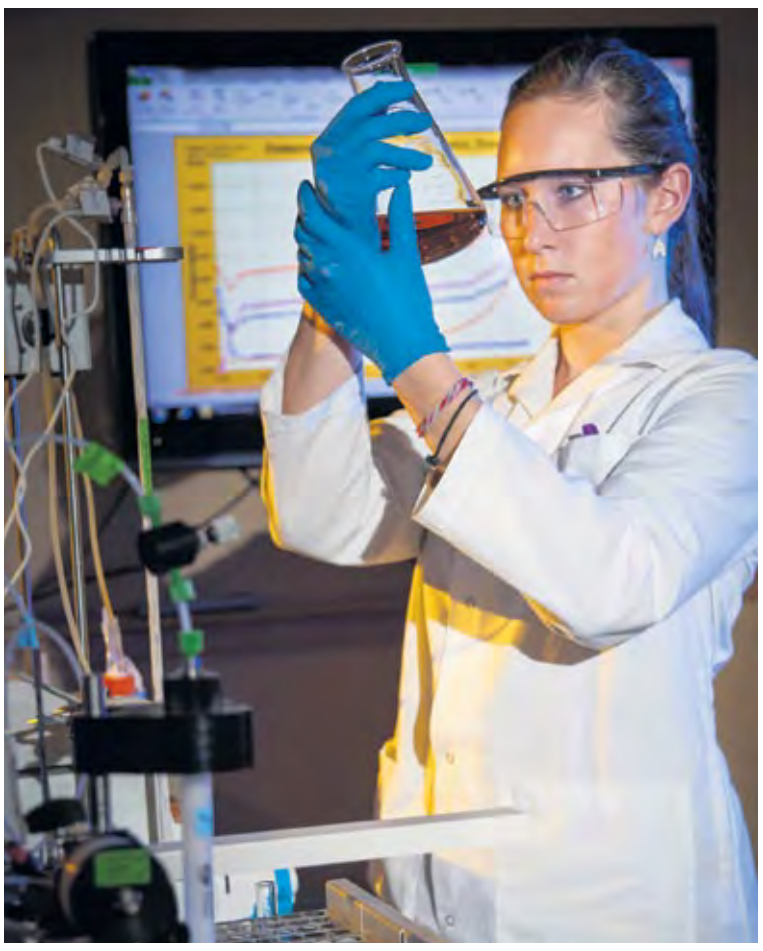
ONLINE?

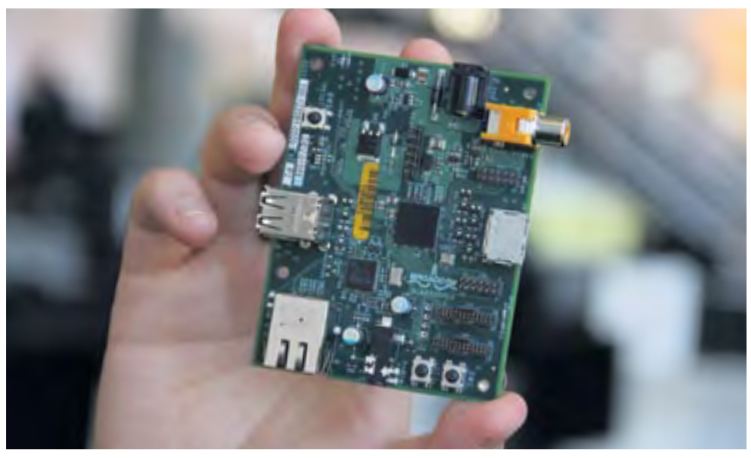
For more information, visit accc.ca.

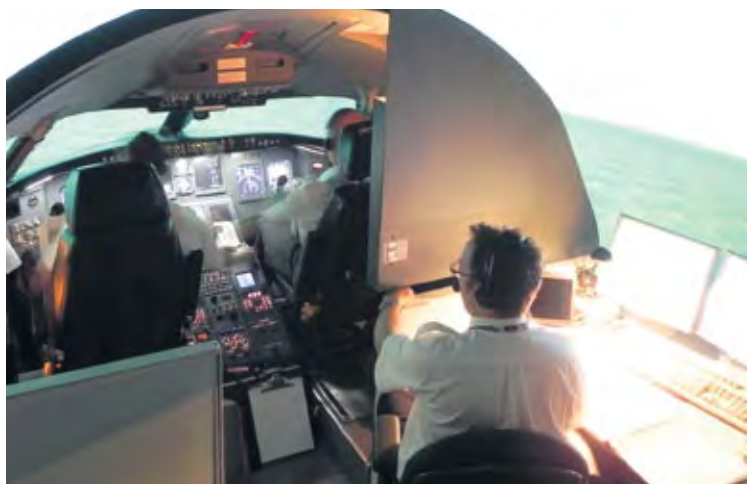
INSIDE

This report was produced by RandallAnthony Communications Inc. (www.randallanthony.com) in conjunction with the advertising department of The Globe and Mail. Richard Deacon, National Business Development Manager, rdeacon@globeandmail.com.

CANADA'S COLLEGES







Clockwise from left: Holland College student; Raspberry Pi, a credit-card sized computer that Seneca College students are working on with software company Red Hat; Seneca College Flight Simulator. SUPPLIED

TECHNOLOGY

From classrooms to commercial applications, partnership programs put students to work

Through innovative partnerships Canadian colleges and businesses are demonstrating ways that technology innovation can be leveraged for Canada's social, environmental and economic gain. In the process, students are learning how to succeed in the hotly competitive tech sector.

"These partnerships serve everyone's interests," says David Agnew, president of Seneca College in Toronto. "Students get real-world experience, industry gets highly motivated research partners and the school gets to be at the leading edge of technological development."

A good example of partnerships paying off is the Popcorn Maker, a free web-based video-enhancement application that was developed by Seneca's Centre for Development of Open Technology and Mozilla, developer of the Firefox web browser.

"Part of the ongoing challenge in communications is keeping content fresh and interesting to engage audiences," says Mr. Agnew. "The Popcorn app does that by allowing professionals and amateurs alike to enrich web-based productions, film and presentations with lots of rich content." The app was used by PBS during the recent State of the Union address by President Barack Obama, and got top billing on InformationWeek's list of 11 Amazing Apps of 2012.

Seneca's Aviation Technology students are also flying high, investigating ways in which aircraft simulators can be used to enhance and speed up the process of pilot flight training. Students are also working with Red Hat, a multinational company in the open-source software space, and Raspberry Pi, developer of a credit-card sized computer.

Holland College in Charlottetown is helping transform Prince Edward Island into a centre of excellence in biotechnology. The school's Bioscience Technology program was heralded by Maclean's magazine as one of Canada's "Red-Hot Postgraduate Programs" in 2011, notes Audrey Penner, director of applied research. The program enables smaller companies that are long on innovative ideas but short on equipment and expertise to develop potential, such as the use of algae to promote animal health.

"A critical role any college plays in the community is to support economic development; industry partnerships are one way to break down the walls between training and the workplace," says Dr. Penner, adding that Holland College is also helping refine tastes in what has come to be known as Canada's Smartest Kitchen (CSK), a research arm of the school's Culinary Institute. Here, new products are cooked up in co-operation with food giants such as Cavendish Farms, which operates a mini production line on site. It also works with boutique speciality firms like Rocky Bay Seafood, which partnered with CSK to find added value in undersized oysters by creating "Oysters RockyFellas," a twist on a traditional Rockefeller recipe that can be found on grocery shelves nationwide.

In the Greater Toronto Area, Sheridan College is making student-partnerships work for all parties by blending project management principles and creativity. "We ask potential partners to tell us what the problem is, what's holding them up, and how we can help. We then determine how the venture can tie into what we are trying to impart to our students," explains Dr. Darren Lawless, dean of research. For example, a recent collaboration between Javelin Reality of Oakville and students from Sheridan's Faculty of Applied Sciences and Technology led to the development of a new, cost-effective 3D pre-visualization program that gave student researchers practical problem-solving and engineering experience.

Dr. Lawless says he is particularly proud of the assistance that students provided to Burlington's m-Health Solutions in the development of its Mobile Cardiac Arrhythmia Diagnostic System. The technology includes two electrodes attached to a cardiac patient that transmit symptoms directly to doctors, via a BlackBerry, allowing a cardiologist to make an informed diagnosis from anywhere in the world. "Our students aren't just doing cool things. It's applied work, taking them from the classroom to real-life situations," says Dr. Lawless. "And if the company benefits, who are they going to hire? The students who worked with them."

OPINION

College grads have great careers

By James Knight
President and CEO, Association of Canadian Community Colleges

Canada's economy needs educated and talented professionals to compete in the global economy.

Our colleges, institutes and polytechnics offer pathways to a rewarding career. Depending on region, 83 to 95 per cent of Canadian college graduates secure employment or entrepreneurial opportunity in their field-of-choice within six months of graduation.

Despite high unemployment, especially among young people, employers and entrepreneurs find it difficult to recruit candidates for positions requiring advanced skills. The Canadian Chamber of Commerce, among many business associations, has identified the skills shortage as the top constraint to economic growth in Canada.

Why? Because we are a rapidly aging population with the baby boom generation transitioning to retirement, while at the same time the technological sophistication of everything we do requires a much more advanced skill set. Seventy per cent of new jobs now require post-secondary credentials.

There is no quick-fix, but colleges are making a big difference. Investments in college programs overcome skills gaps, reduce unemployment, enhance productivity and give every Canadian access to a financially rewarding career.

The accessibility, low cost and career outcomes of Canadian college programs are designed to develop a highly skilled workforce. College grads get jobs. They allow businesses to maintain their competitive advantage in everything from resource development to information and communications technology, from video game design to golf management, from aviation to shipbuilding, from broadcasting and journalism to business management, from culinary arts to wine making, from technology and trades professions to fashion design, not to mention more than 40 specialized health professions, all of which offer attractive career pathways. For every employment or economic opportunity, there is a college program.

Digital technology expands access to learning opportunities. Tens of thousands of working Canadians, many with families, turn to online college programs to upgrade their skill sets to expand career horizons. Interactive, web-based programs translate into learning anywhere, anytime. In addition, Canada's 1,000 college campuses are rooted in rural and remote communities, serving as catalysts for local socio-economic well-being by providing access to learning aligned with the local economy.

Canadian colleges support the innovation needs of small and medium-sized businesses while creating meaningful employment opportunities for graduates. Through partnerships with industry and government, colleges drive Canada's economy forward.

Increased engagement in applied research is positioning colleges to contribute to Canadian innovation with enhanced research infrastructure and involvement of faculty and students. Colleges partnered with 4,586 companies last year. Colleges improve the capacity of small and medium-sized enterprises to engage in research and development that delivers new or improved products, services and processes, while giving students hands-on experience in innovation.

Investments from governments, private industry, foundations and institutions themselves are enabling Canadian colleges to share their expertise internationally. Over the past year, institutions from British Columbia, Alberta, Manitoba and Ontario have showcased Canada's college applied research capacity and expertise through partnerships in more than a dozen countries, including Brazil, Chile, China, Costa Rica, Denmark, Dominican Republic, Mexico, Egypt, Japan, South Korea, South Africa, the United States and Uruguay.

College expertise also supports the Canadian Immigrant Integration Program (CIIP), creating opportunities for newcomers to Canada. The program, designed and managed by the Association of Canadian Community Colleges and funded by Citizenship and Immigration Canada, has assisted more than 20,000 immigrants before their arrival in Canada so that they have a better experience connecting their skills and credentials with employers.

Canadian colleges, institutes and polytechnics serve the needs of 1.5 million learners in full-time, part-time and continuing education. Canada must do all it can to make certain its citizens have the skills needed to participate in the economy. Colleges, institutes and polytechnics are key to making it happen.

At SIAST and other institutions across Canada, Aboriginal students are mastering the advanced skills required to succeed in the emerging knowledge economy. SUPPLIED

NOVA SCOTIA COMMUNITY COLLEGE

Program builds opportunities for Aboriginal students in Nova Scotia

A strong relationship with the Unama'ki Economic Office and Bell Aliant is a perfect example of Nova Scotia Community College's (NSCC) collaborative efforts to help build Nova Scotia's economy and quality of life through education and innovation, says college president Don Bureaux.

"This will remain our focus as we transform Nova Scotia one learner at a time," says Mr. Bureaux.

Spearheaded by Alex Paul, a member of NSCC's board of governors and the director for the Unama'ki Economic Benefits Office, the group developed the Bell Aliant Fibre Optic Program for Aboriginal Learners. "A 16-week course at Marconi Campus was created and supplemented by hands-on training with Bell Aliant," says Mr. Bureaux. "The students have been excited about the opportunity, completion rates are good and the utility is already employing the majority of those initial graduates. It is a collaboration that made sense and produced a very positive outcome."

NSCC operates 13 campuses across the province.

ST. LAWRENCE COLLEGE

Opportunity knocks with welding innovations

Five St. Lawrence College students have put their advanced skills to work and developed a method for improved marine welding precision. Through an industry partnership to provide work experience, the students' innovative new welding process has given MetalCraft Marine Inc. a strategic advantage in the marketplace.

"The welding project with the college will set us apart from our competition," said MetalCraft contracts manager Bob Clark. "This new process will save us hundreds of thousands of dollars, giving us a competitive advantage like no other company will have."

Over 40 weeks, students assisted technicians and consultants preparing sample welds and presented their findings. The students' approach has streamlined the production process, enabling efficiencies in both time and cost of production of high-performance emergency watercraft such as fireboats.

CANADA'S COLLEGES

RESEARCH

Growers see opportunities in ancient method to raise fish, grow crops

Rooted in traditional agricultural practices, a novel applied research project at Alberta's Lethbridge College is yielding interest among food growers and retailers.

In ancient times, farmers cultivated fish and plants in a joint growing system. Fish waste was used to fertilize the plants, which in turn acted as a bio-filter to produce fresh clean water for the fish.

It works much the same today, with fish tanks and large heated greenhouses. "We have an amazing facility here on campus with 30,000 grass carp and an operating greenhouse," says John Derksen, head of research at the Lethbridge College Aquatic Research Centre.

"Aquaponics-grown vegetables, immune to the cattle run-off of field-grown produce, pass public health inspections with flying colours."

Penny Takahashi
is a technician at Lethbridge College

Initially viewed as an option solely for fish farmers, the college's aquaponics project is attracting interest from commercial food retailers, new farmers and even homeowners.

"We have 500 people a year touring our facility," reports Mr. Derksen.

Technician Penny Takahashi grows and monitors vegetables in the greenhouse, including tomatoes, cucumbers, lettuce, basil and beets. Ms. Takahashi says there is no need for commercial fertilizer for certain crops, but small amounts of micronutrients must be added to crops such as tomatoes that need calcium.

Lethbridge College's aquaponics growth process offers potential to produce food crops faster, even in Canadian winters. SUPPLIED

"The aquaponics growth process is more productive than field production. The potential is huge, because of the anticipated ability to produce a crop and get food to market quickly," she says.

Mr. Derksen says there is interest in finding ways to use the system throughout the year. "It's too costly to heat and light a greenhouse all winter. We want to look at the cost for growing year-round in a heated room using LED lighting, and other environments as well."

The feasibility of this idea, he adds, goes up as the price for LED lighting comes down.

Meanwhile, the college's aquaponics project has attracted the interest of the co-op supplier to the main grocery stores in Alberta.

"We envision contained tractor-trailer-size units that can be transported into remote northern locations or attached to the back of a grocery store," Mr. Derksen explains. "The units would contain the living fish and produce the vegetables. Store clerks could simply pick the produce and stock the store with it."

"Aquaponics-grown vegetables, immune to the cattle run-off of field-grown produce, pass public health inspections with flying colours," adds Ms. Takahashi.

The college plans to launch its first aquaponics course this year.

LOYALIST COLLEGE

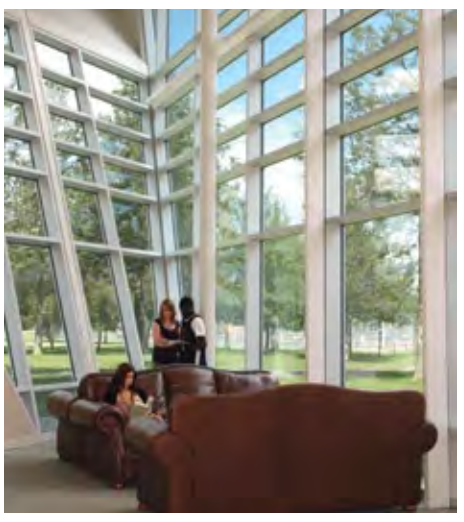
Skilled trades open new career doors for women

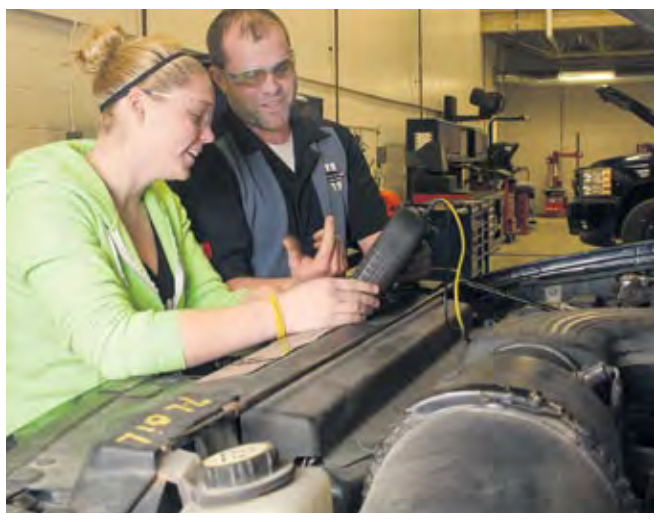
In the realm of skilled trades, a traditional battle of brains versus brawn is being redefined as demand rises for workers with fine motor skills and technological know-how.

In this emerging workplace realm, opportunities are rising for women with the right training, says Heather Inwood-Montrose, Red Seal Welder and professor of the Manufacturing, Mechanical & Welding Techniques programs.

"Loyalist College is committed to enhancing women's access to skilled trades through a wide range of programs, from electrical and mechanical to automotive, welding and construction," she says. "When women come into Loyalist's new Sustainable Skills, Technology and Life Sciences Centre, they immediately see the possibilities."

Women learners feel comfortable in the clean, airy 121,800-square-foot skills centre, where they use the latest equipment to gain the in-depth knowledge and experience employers are looking for, Ms. Inwood-Montrose notes.





Loyalist College's new skills centre provides trades students with the latest in equipment. Left, Loyalist College's new library. SUPPLIED

To encourage young women to explore a career in skilled trades, Loyalist hosts an annual Tradewise event for female students in grades nine and 10 from more than 10 schools. In addition to providing an introduction to the trades early in a child's education, Loyalist also works to educate teachers and guidance counsellors on the benefits of apprenticeships and other trades programs.

The Ontario Youth Apprenticeship Program (OYAP) is another vehicle for enticing young people to pursue apprenticeship training. Provincially funded, the program allows students 16 years or older to complete their high school diploma while working toward their apprenticeship. At Loyalist, students can participate in OYAP programs, including automotive service technician, child development practitioner and cook, among others. Participants then have the option to apply to a college-level program with advanced standing, enabling them to go directly into their second semester.

FLEMING COLLEGE

New trades and technology centre creates advanced training opportunities for Peterborough

Through a unique partnership with education and industry, the $36.6-million, 87,000-square-foot Kawartha Trades and Technology Centre in Peterborough will teach and train students from regional secondary schools, Fleming College and local industry.

The funding proposal for the centre was developed by a partnership that included local industry, school boards, community organizations and the college. As part of an analysis into local and regional industrial needs, Fleming College's president Dr. Tony Tilly toured more than 50 industrial organizations in the region, an initiative that proved valuable in garnishing support for the centre as well as for developing industry partnerships that provide guidance on the current and future skill needs of employers in the region.

"Creative pathways in our academic programming allows students of wide-ranging abilities to be successful in the most basic to the most advanced levels of learning underway, and we seek to ensure that students are 'job ready' in all levels."

Ann Drennan
is the dean of Fleming College's School of General Arts & Science, and School of Trades and Technology

"This relationship is ongoing, demonstrated by our industrial advisory committee that meets regularly to ensure that the college stays abreast of industry needs and advancements," says Ann Drennan, the dean of Fleming's School of General Arts & Science, and School of Trades and Technology.

Located at Fleming College's Sutherland Campus, the new facility will provide additional space and equipment for training in areas such as carpentry, masonry, welding, plumbing and machining. With state-of-the art, sustainable shop facilities, smart-wired classrooms and labs with the newest technology, the centre will offer all students access to a full suite of services and supports and a vibrant campus life.

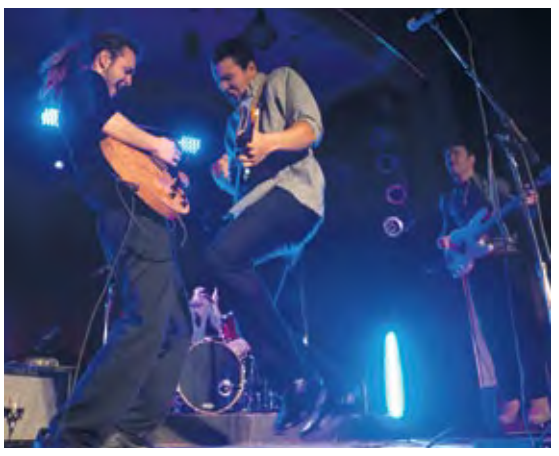
The Kawartha Trades and Technology Centre at Fleming College, funded through a unique partnership, will provide space and equipment for advanced skills training. SUPPLIED

"Our trades and technology programs are designed with the latest workforce development data," says Ms. Drennan, adding that students are able to access an interdisciplinary approach to applied learning in the uniquely designed Applied Learning Centre.

"Creative pathways in our academic programming allows students of wide-ranging abilities to be successful in the most basic to the most advanced levels of learning underway, and we seek to ensure that students are 'job ready' in all levels," she adds.

FANSHAWE COLLEGE

For talented musicians, this program rocks



Fanshawe College's music program is at the heart of a growing music scene in Southern Ontario. SUPPLIED

As a producer of Juno Award-winning graduates, Fanshawe College is considered a vibrant force in the Canadian music industry. Today, the college has a bold new vision to create a thriving centre for the performing arts and Canadian music in its hometown of London, Ont.

Dana Morningstar, chair of the Fanshawe School of Contemporary Media, points to the success of Austin, Texas, when she talks about the college's potential in the music industry. Austin is famous in the music world for its music and digital production industries.

"We hope the scope of our music production programs at Fanshawe will bring the same level of success to the London area," she says, predicting that the school's 30-year-old Music Industry Arts program will result in the creation of "Austin North."

Faculty members are heavily involved in the music industry, Ms. Morningstar says. "Professor Dan Brodbeck is a recent Juno award winner, and three faculty members are Juno judges," she notes. There is a Juno named after the program's founder, the late Jack Richardson, a producer of the Guess Who, Alice Cooper and Bob Seger.

Aspiring students, attracted by the fame of Fanshawe's faculty and graduates, compete for sought-after spots in the program. Ms. Morningstar says that only the top are accepted – just 110 out of more than 700 applicants.

Some Fanshawe graduates achieve celebrity status. Emm Gryner, a prolific Canadian independent singer-songwriter, sang and played keyboards in David Bowie's band. Entertainer Les "Survivorman" Stroud performed at the recent Green Inaugural Ball in Washington, D.C. Trevor Morris engineered the soundtrack for the 2012 production of the movie *Immortals*, and two other recording engineering graduates are Juno winners.

Fanshawe students train in music engineering, recording, songwriting, contract law, and artist management and development, as well as the physics of sound.

"We've got all the key ingredients to increase the importance of music in the Canadian economy," Ms. Morningstar adds.

CANADA'S COLLEGES

Left to right: Star Pollan and Nicole Martini have achieved lucrative careers in skilled trades as a result of training at Okanagan College; SIAST prepares Saskatchewan's youth to bridge the acute labour shortage in that province. SUPPLIED

ENROLMENT

Promising programs entice students from all walks of life

There's a new acronym in Canada's education and human resources sectors: NENE. It refers to adults who are "Not Enrolled" in post-secondary education and "Not Employed." To help such Canadians achieve full employment – and address worsening skills shortages – colleges across the country are introducing programs to increase enrolments and success rates.

"Our aim is to ensure that all of our population can have maximum participation in the labour force."

Brian Henderson
is director of student development at the Saskatchewan Institute of Applied Science and Technology

The mismatch between employees and jobs is particularly acute in Saskatchewan, which has a daily average of 10,000 largely skilled positions open, yet high unemployment among its First Nations, who constitute 21 to 24 per cent of the province's population.

Education is the solution, says Brian Henderson, director of student development at the Saskatchewan Institute of Applied Science and Technology (SIAST).

"Our aim is to ensure that all of our population can have maximum participation in the labour force," says Mr. Henderson. In the process, he notes, "the richness of diversity in our classrooms opens everyone's eyes to the idea that we have different ways of looking at things. When our students transition into the workforce, they're that much more prepared and knowledgeable."

SIAST's leadership in Aboriginal engagement has two aims: attracting students and ensuring they have the support they need to succeed in a new environment.

Advisers from the institute accompany health and science faculty and students on visits to First Nations schools to talk to youth about opportunities. Veterinarians and vet-tech students travel north to spay and neuter dogs, where they meet families and potential students. "It's a very practical way of connecting," says Mr. Henderson.

Aboriginal applicants are called by student advisers, who offer support with the application and relocation process. A four-week summer program helps rural students find places to live, arrange childcare, open bank accounts and become familiar with bus routes and their campuses.

Advisers stay in contact with students to identify any difficulties that emerge, while Aboriginal counsellors are available at campus activity centres. Elders visit the four campuses regularly, and Aboriginal leadership programs are offered. "If students are successful in their programs and feel positive about their experience, they're going to be our best recruiters, sometimes in geographically isolated places that our recruiters may not be able to get to," explains Mr. Henderson.

Okanagan College in British Columbia is addressing the dire shortage in skilled trades such as welding, aircraft maintenance and carpentry by targeting another non-traditional group: women. Many enter through a 12-week program, funded through the Canada-British Columbia Labour Market Agreement, where they experience a range of trades and develop basic skills.

Women starting the program are usually unsure, but they gain confidence and can soon look people in the eye and speak about their skills, says Nancy Darling, administrator of the trades and apprenticeship program. They learn that a smaller stature and less physical strength are no longer barriers to such jobs, given technical and workplace safety advances.

Nicole Martini was working in retail when she entered the program. Today, she's a third-year apprentice plumber, and she and her fiancé just bought a house, a distant dream for many of her generation. "She's gone from working for minimum wage, with no real potential to move up, to having a great career path and an excellent employer," says Ms. Darling.

Star Pollan, a young single mother, entered the program after working as a labourer on construction sites for 10 years. She had earned minimum wage and was always among the first to be laid off, because she was unskilled. After initial training as a heavy-equipment mechanic, she moved to Prince George and became an apprentice with the Province of B.C. She earns a high wage and rents a three-bedroom house with a big yard for $800, the price of a one-bedroom apartment in her hometown of Kelowna. "She is on a totally different career path, with a different life ahead for herself and her daughter," says Ms. Darling.

Feedback from employers is positive, she adds. "Our graduates are all finding employment in every single trade. We've heard from our friends over at WorkSafeBC that women are preferred when it comes to things like heavy equipment operating, because they are more careful on the big machines – an employer can save $100,000 a year on maintenance. In all the trades, their skills are speaking for themselves."

BOW VALLEY COLLEGE

Novel assessment tool identifies essential skills levels

How can employees demonstrate their skills more concretely than simply showing the grade level they completed? That's the question that Conrad Murphy, director of the TOWES department at Bow Valley College in Calgary, posed as he attempted to devise a system to quantify literacy and numeracy by skill levels. Today, the Test of Workplace Essential Skills (TOWES) is used by more than 300 colleges and employers across Canada.

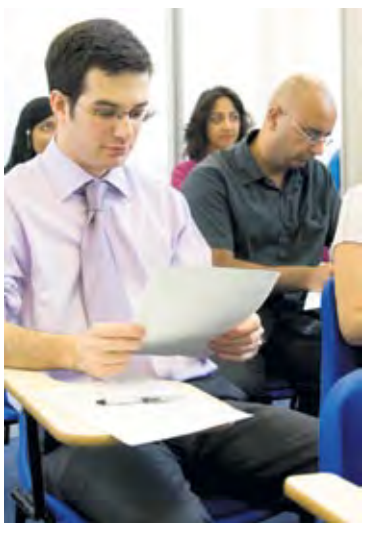
"We knew we had a great product, based on solid research, so it made sense to develop it."

Conrad Murphy
is director of the TOWES department at Bow Valley College

Using studies by Statistics Canada and Human Resources and Skills Development Canada, Mr. Murphy developed TOWES as an assessment where higher levels would reflect more sophisticated abilities. For instance, workers at level one would be able to read very simple documents. At level two, they would be able to read, but only to complete repetitive tasks. At level three, they would be able to consult multiple sources of information, make inferences and cycle back through a document.

Fortunately, improving skill levels is manageable. "With a 30-hour training intervention, we can usually move individuals from level two to three," says Mr. Murphy.

For testing materials, TOWES relies on actual workplace documents and tasks that emphasize applied knowledge. Documents can be customized, for example, in apprenticeships or in sectors such as manufacturing. The program is being moved to a web-based format.



Bow Valley College is a pioneer in essential skills testing, enabling colleges and employers to accurately quantify and build skills levels.
ISTOCKPHOTO.COM

Not only is it unusual that the research was conceived and produced in the college setting, but Bow Valley has also decided to distribute the program across Canada. It is being translated into different languages, and Mr. Murphy is investigating new ways of using it in countries throughout the world.

"We knew we had a great product, based on solid research, so it made sense to develop it," he adds.

Canada needs a balanced approach to developing talent and the range of skills of its citizens, says James Knight, president of the Association of Canadian Community Colleges. "Over 40 per cent of adult Canadians lack the foundational skills of reading, writing and numeracy, as well as the skills to manage information and problem solve, to work with and communicate effectively with others, and to use digital technology," he explains. "Canadian colleges, institutes and cégeps have developed solutions that help reduce non-completion rates and upskill individuals in education for the workplace, which enables them to succeed in the global economy."

HOLLAND COLLEGE

Research proves value in social investments

Canadian colleges are well positioned to promote economic growth through partnerships as well as address social challenges. Sometimes they do both at the same time.

Holland College in Charlottetown proved this when it teamed up with Prince Edward Island's Department of Community Services and Seniors to develop a protocol for more effectively identifying clients on social assistance who can benefit from intervention and training programs designed to integrate them into the labour force. "We found there were strong indicators that showed social assistance clients who could readily become productive members of society," says Audrey Penner, the college's director of applied research, adding that the research findings have already attracted national attention. "We don't normally look to this segment of society as a source of economic development, but with our aging population, we can't afford to leave anybody behind. We need to invest in every person."

INTERNATIONAL EDUCATION

Aspiring doctors find welcome option offshore

St. George's University in Grenada prides itself not only on bringing together students from diverse backgrounds, but in returning them to their home countries as highly trained professionals. For Canadian students facing a competitive medical and veterinary school environment, St. George's offers another option for achieving those dreams. The fact that it's set in a tropical paradise probably doesn't hurt its appeal either.

Founded in 1976, St. George's includes about 6,000 students from 88 countries around the world. Canada is the second most common country of origin, with 700 Canadians currently in attendance. The medical school takes in approximately 625 new students each year, plus there are about 100 students in the newer veterinary school. The university also offers undergraduate programs.

What compels medical students to choose St. George's? University Chancellor Charles Modica says their top motivation reflects the pragmatism typical of those in med school. "Frankly, they're attracted to the fact that we have one of the highest pass rates in world for the medical boards," says Dr. Modica. "These are people who are driven, who do well in school."

Once they arrive at St. George's, students are impressed by each course's 8- to 10-member breakout groups and by the proactive academic support provided in the department of educational services.

Cultivating diversity is also a deliberate goal at St. George's. "We want our students to study in an environment where they are associating with medical students like themselves from all around world, from every race, religion and creed," says Dr. Modica. "They'll be better world citizens in the future, having studied with each other."

Dr. Modica is proud of the school's role in the economy of Grenada, where it employs more than 650 locals. St. George's meanwhile maintains international ties. by affiliating with universities from the U.S., the U.K. and Canada. Interestingly, a major route to St. George's for Canadians is via the U.K.; many international students do a first year of basic sciences at Newcastle's University of Northumbria, then study in Grenada and complete clinical training in the United States.

With the St. George's home page displaying images of the campus's modern orange-roofed buildings overlooking blue water, the one thing the university website leaves out is the typical February temperature – in the high 20s Celsius. While probably not a deciding factor for an aspiring professional, it may be a consideration for students coming from northern climates.

CANADA'S COLLEGES

Centennial College student Rita Arruda, centre, spent three months in Ghana, doing research on literacy programs and awareness of citizens' rights in remote communities. SUPPLIED

REAL-WORLD CLASSROOMS

International education nurtures globally minded students and faculty

When she left Centennial College's Toronto campus last year for a summer internship in the West African country of Ghana, Rita Arruda stepped out of her comfort zone and into a real-world classroom unlike anything she had ever known.

Working for a non-profit group that promotes education as a human right and a way out of poverty, she spent three months doing research on literacy programs for children in cocoa farms and on awareness of citizens' rights in remote communities.

"The whole experience was eye-opening," recalls Ms. Arruda, who graduated last year from Centennial's Child and Youth Worker program. "It gave me a view of a very different world and culture."

Ms. Arruda is among the thousands of college students in Canada who travel overseas each year as part of a student exchange, internship or work-abroad program. Beyond being opportunities for personal enrichment, these trips are seen as beneficial to the students' future careers.

"Global citizenship is about understanding yourself and your place in the world, and being able to identify beliefs, values and actions that help create respectful behaviours. It's a knowing and respecting of the many different ways of life in the world."

Ann Buller
is president and CEO of Centennial College and ACCC board chair

In a study by the Canadian Bureau for International Education, 91 per cent of employers identified many benefits of studying abroad, including greater self-sufficiency, understanding of cultural differences and adaptability to unfamiliar environments.

Not surprisingly, Canada's colleges have become increasingly focused on activities and curricula designed to "internationalize" students. A 2010 survey by the Association of Canadian Community Colleges (ACCC) found that more than 60 per cent of colleges are engaged in such activities. Four out of five said they intended to do more to help their students study or work abroad.

Ann Buller, president and CEO of Centennial College and ACCC board chair, says international education is a must for schools that believe in shaping and nurturing global citizens.

"Global citizenship is about understanding yourself and your place in the world, and being able to identify beliefs, values and actions that help create respectful behaviours," she explains. "It's a knowing and respecting of the many different ways of life in the world."

Through its Global Experience Office, Centennial connects students to work or study programs in countries such as Brazil, Peru, Dominican Republic, Ghana and Jamaica, where they help build schools, usually in rural communities. All first-year Centennial students, no matter what program they're in, must take a course in global citizenship, says Ms. Buller.

Canadian students aren't the only ones going abroad in the effort to internationalize education. At St. Lawrence College in Kingston, Ont., faculty members can work on projects that help overseas schools develop curricula in particular fields. One such project is at the National Tool and Engineering Institute in Kingston, Jamaica, which is developing programs in renewable energy, with funding from the Canadian International Development Agency (CIDA).

"We're the leading college in Canada for renewable energy, so it made sense for us to take on this project," says Don Young, dean of the Faculty of Applied Science at the college.

St. Lawrence also recently forged a partnership with the Institute of Technology Tralee in Ireland to give students in nine different programs a chance to earn their degrees there. Ireland's credential structure allows Canadian students with a two-year diploma to get a bachelor's degree in a year, or an honours degree in just two years.

Like St. Lawrence College, Toronto's Humber College has been hard at work creating more global opportunities for its students and instructors. Through its International Development degree and post-graduate programs, students and faculty can participate in overseas human resource development activities. Students can apply for internships with organizations such as Oxfam, World Vision and Save the Children Canada, while teachers have opportunities to work on curriculum development at overseas universities.

"These activities benefit our institution by providing an enriched, international spirit on campus," says Kent Schroeder, director of international development projects at Humber's International Development Institute.

The college is working on a five-year, $4.6-million project to help develop entrepreneurship curricula at seven universities in Sulawesi, Indonesia. The project, financed jointly by Humber and CIDA, will involve 16 faculty members and some student interns, adds Mr. Schroeder.

SOLUTIONS

Colleges unleash faculty, students and facilities on today's business challenges

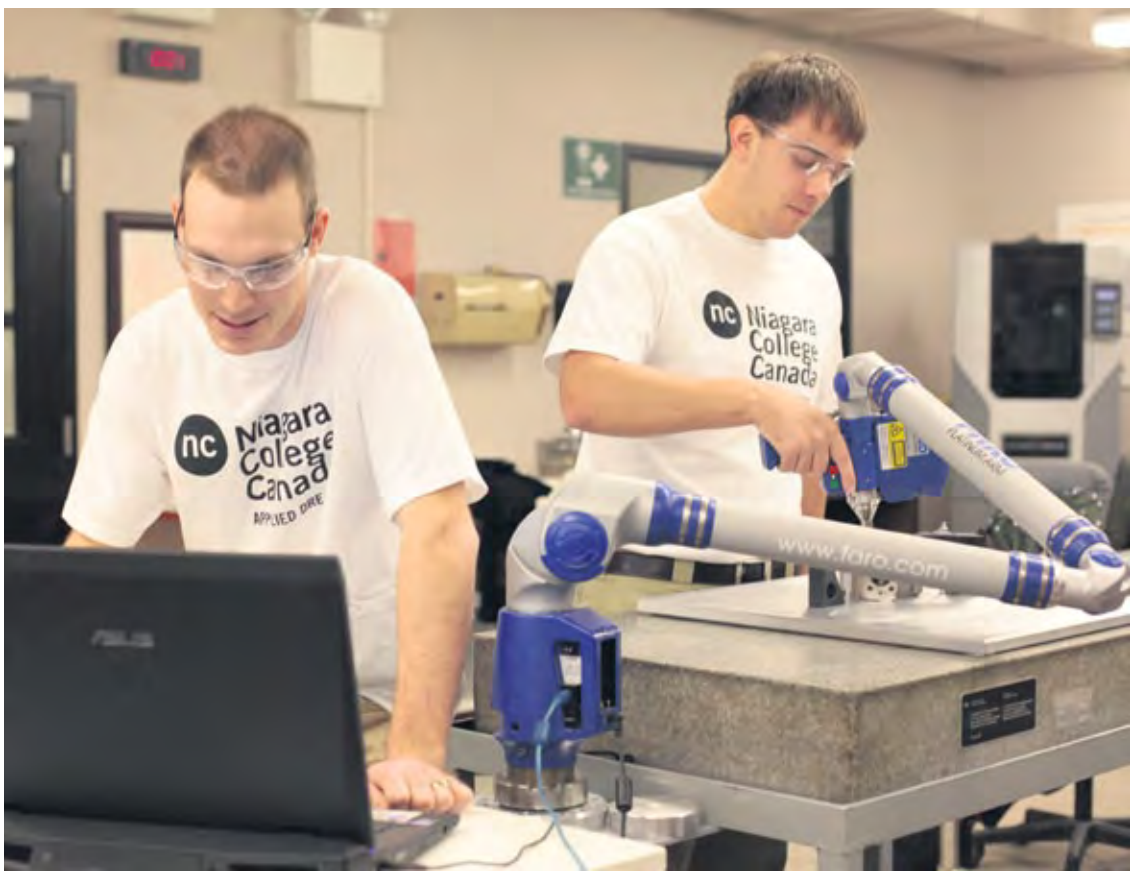
Small and medium enterprises across Canada share a common challenge: they must innovate to compete in an increasingly global marketplace, but they often don't have the time, expertise or budget for R&D. The solution to this age-old conundrum may now be as close as their local college or polytechnic institute.

When Jim Sheehan of Durham Foods in Port Perry, Ont., needed expert advice to help his company prepare for the extensive audits required for certification by CanadaGAP, a food safety program, he approached Niagara Research, the applied research division of Niagara College.

Niagara Research made the whole process simple, says Mr. Sheehan. "I didn't need theory – I needed somebody to help me get my products to market. They are very keen on sharing applied knowledge, bringing in students. Everyone had such great ideas that we've now expanded to three projects."

The only producer in North America to commercially grow and sell hydroponic spinach, Mr. Sheehan was faced with the innovator's dilemma: all the equipment he needed had to be invented, including harvesters that could glean spinach grown in trays holding 500 to 1,000 kilograms each. "We had to build and design commercial-scale harvesters, seeding systems and germination processes," he explains. "That's what Niagara College is working with me on now, and they helped me get the funding required through the provincial and federal governments."

Mr. Sheehan has since introduced other companies to Niagara College. "They didn't have any idea that kind of talent is available to help them at a reasonable cost," he says. "I wouldn't have been able to afford to do what I did if I had to hire engineers and consultants at today's rates. It just wouldn't have been possible for me."



Niagara College student research assistant Jason Van de Laar, left, and senior research associate Mike Holderney, right, participate in the success of local entrepreneurs through applied research partnerships. SUPPLIED

PaperNuts in St. Catharines, Ont., imported equipment from Finland to manufacture its unique packaging product, which opens up during transportation to interlock and form around items being shipped. But the company discovered it needed to develop additional, specialized equipment to ensure that the recycled paper used in its process could be fed into a machine with consistent tension.

"Being a startup company, we didn't have the money to bring in an engineer," says PaperNuts co-founder Joanne Secord.

The solution was found at Niagara College. The students and faculty did extensive testing, created the required equipment, developed an operating manual and brought the college's electrical division in to create a remote-control for the key machinery, adding an additional measure of operating safety.

"It's not well known that colleges do applied research as well as providing qualified personnel for companies to hire," said Marc Nantel, Niagara College's associate vice-president of research and innovation. "We help small and medium enterprises design and test products, and become more productive through lean manufacturing audits and implementation; we even provide business services."

"It's not well known that colleges do applied research as well as providing qualified personnel for companies to hire."

Marc Nantel
is associate vice-president of research and innovation at Niagara College

It's difficult for companies that are struggling to make ends meet to dedicate resources to devising and testing new products, he says. "But if they don't look at the future and the next generation of products, then someone else will – while they become obsolete."

Colleges help by providing the equivalent of R&D departments for these small companies, he explains. "We unleash our faculty, students and facilities on their problems."

For students, such applied research means an opportunity to work on "real problems in real companies in the real world," notes Dr. Nantel. "They come to understand how industry works, how problems are encountered and solved, and how to work in multidisciplinary teams."

In addition, when students help solve a particular problem for a company, and that company sees increased growth and sales as a result, it often needs to take on more employees, he says. "The best way to transfer technology is to hire the brain that solved the problem you had. A lot of our students are hired by these companies when they graduate. When you work with a company on a problem for eight months, it's like an eight-month interview."

When the PaperNuts co-founders presented their company on CBC's Dragons' Den in January and received funding from the show's tough judges, it was a triumph for Niagara College as well as for Ms. Secord and her partners. "PaperNuts is a fantastic packaging filler," she says. "There is no greener, more economical packaging option. But no engineer we might have hired could have done everything Niagara College has done to bring us this far."

CANADA'S COLLEGES

SENECA COLLEGE

Technology sharpens eye on early childhood education

New technology developed for the Early Childhood Education (ECE) program at Toronto's Seneca College has far-reaching implications for the future of teaching, says Professor Nancy Brown.

Ms. Brown, who developed the two-year-old iLook system to allow ECE students to peer into actual classrooms and learn about childhood development without leaving their desks, says it gives Seneca a competitive edge over other colleges and has national and international potential.

The iLook technology is used at Seneca's Early Childhood Education Observation Laboratory Teaching School, a fully functioning childcare facility that is a demonstration and observation centre for the college's School of Early Childhood Education Diploma Program.

Seneca has the largest ECE program in Ontario, with 1,300 daytime students and 600 apprenticeship students. "There are 20 ECE classes going on at any given time," says Ms. Brown.

Many lab schools outside the GTA have closed, creating an opportunity to use Seneca's lab school technology for toddlers, preschoolers and kindergarten children in colleges across the province, Ms. Brown notes.

"We now have broadcast-quality, automated cameras with full audio," Ms. Brown says. "It's simple to use. With an easy touch on my computer screen, I can get an instant overview of what's happening in the room. "

Ms. Brown says that as she teaches, she can remotely move the cameras from table to table at lunchtime, for example, or from one activity centre to another at playtime. "We look for developmental milestones in the children, and we also watch how the teacher interacts with them."

The system is "completely engaging," she says. "The quality is fantastic and cost-effective. We don't need to hire editors or sound people."

Instead of standing at the front of a classroom lecturing on childhood development, Ms. Brown explains, "I use the technology to take my students right into the classroom in real time. The students watch the children as the cameras, which are attached to the ceiling, migrate around the room."

The teacher can stop the camera at any time to allow the students to discuss what they are seeing and hearing.

"My role changes," she says. "As a group, students are exposed to model curriculum delivery. I guide their conversation, while they are empowered to share their knowledge and observations."

In the past, students had to crowd into tiny observation booths next door to classrooms in order to watch the children, who couldn't be heard through the glass.

Ms. Brown believes the system could revolutionize teaching in other fields and in other countries. "We could use it in our nursing program, or in veterinary medicine – any teaching that requires students to learn by watching."

New technology developed by Seneca College allows early childhood education students to learn by watching interactions in childcare facilities. SUPPLIED

"I use the technology to take my students right into the classroom in real time. The students watch the children as the cameras, which are attached to the ceiling, migrate around the room."

Nancy Brown
is a professor at Toronto's Seneca College

HUMBER COLLEGE

Targeted initiatives connect students with employers

Those who can, do.

Driven by that conviction, Humber College requires all of its Bachelor of Commerce degree students to complete a 14-week paid work placement with a company in their industry, as part of a comprehensive approach to help students achieve employment in their field upon graduating.

In addition, specific placement advisers are assigned to each degree. "Placement advisers work with each student to develop and discuss their employment goals, while offering knowledge, techniques and skills to help them land the work placement or job opportunity they desire," says Paul Griffin, associate dean of Humber's business school. "Advisers are connected to industry, which helps students as they network, meet potential employers and organize workshops with industry partners."

Program co-ordinators and placement advisers run diverse events – with employers such as TD Bank Group, Monster.ca, LinkedIn and Samsung – that provide students with the opportunity to create relationships with industry professionals while increasing their networking skills.

Work placements provide students with experience in their field prior to graduation, while broadening their view of the type of positions available. Conversely, employers have the opportunity to get to know the high-quality students graduating from Humber's Bachelor of Commerce programs. As a result, "many companies are hiring for work placements and recruiting graduates for full-time positions," reports Dr. Griffin.

NORTHERN LAKES COLLEGE

Industry support key to solving power engineer shortage

Northern Lakes College recently announced a campaign to raise $2 million for the creation of a Power Lab training centre in Peace River by January 2014.

The Peace River Regional Power Engineering Project and the college's unique power engineering program will help reduce the extreme shortage of power engineers throughout the Peace Region and across Northern Alberta.

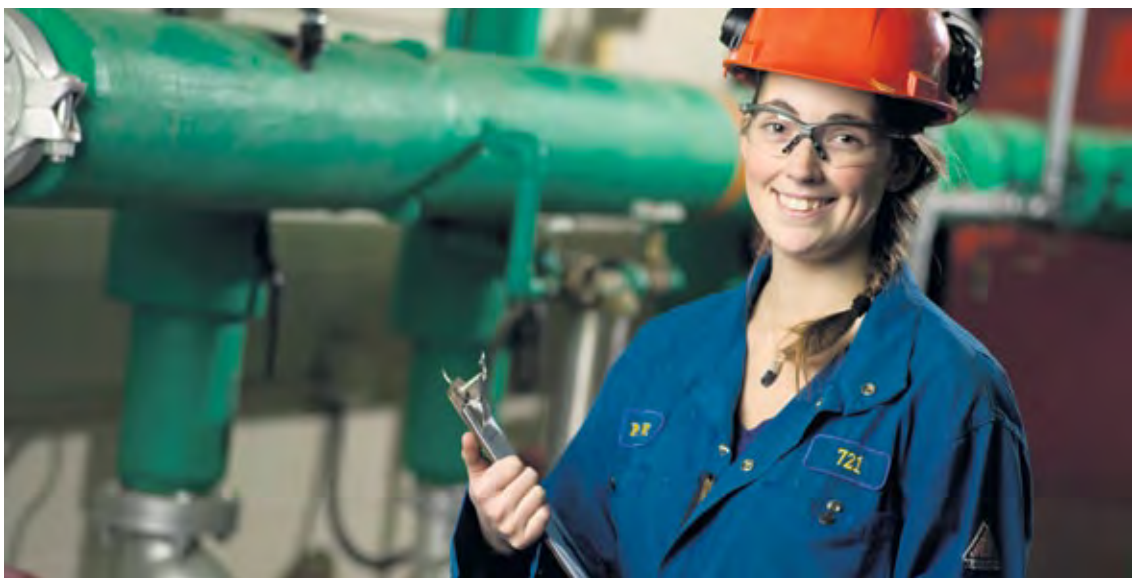
"Industry has indicated that one of the largest obstacles to training new power engineers, and advancing those who are already in the occupation, is obtaining the necessary steam time for certification," says Northern Lakes College president and CEO Rick Neidig. The proposed power engineering lab will accommodate more than 80 students a year.

There are six intakes into the power engineering program throughout the year, and the program is delivered online anytime, explains Mr. Neidig. "Students are free to access their online program components on a schedule that suits their needs, so long as they meet program pace expectations."

This accommodates students who are already working and those who require the flexibility to fit this program into their personal schedule.

"The power engineering course through Northern Lakes College is a wonderful educational experience," says Brandon Boudrea, a student in the program. "Being able to take the course online offers the flexibility to learn at your own pace, but has enough structure and guidelines to follow so that you can maintain a good pace and not fall behind."

The new training centre will mean that more power engineers can be equipped and on the job faster. "Industry has expressed the need for this power lab as a critical component of employee development, and industry's desire to support this initiative demonstrates the growth within the region," says Mr. Neidig.



Northern Lakes College's power engineering program aims to reduce the extreme shortage of power engineers in Northern Alberta. SUPPLIED

NORTHERN LIGHTS COLLEGE

Training benefits from industry input

At Northern Lights College (NLC), community and industry partners are key contributors to programs that meet the current and future needs of B.C.'s labour market.

"I've never seen this level of multi-partner collaboration before," says Laurie Rancourt, the college's president. "We don't just get donations, or school district letters of support. Local industry contributes the expertise our students need. Highly skilled operators come to work with us on projects."

Opened in 1975, NLC has campuses in Chetwynd, Dawson Creek, Fort Nelson, Fort St. John and Tumbler Ridge, as well as access centres in Atlin, Dease Lake and Hudson's Hope.

NLC is B.C.'s Energy College. Students and faculty enjoy the unique opportunity to work with partners to provide training for jobs in the oil and gas industry, and in the field of clean energy technology.

A provincial Centre of Excellence in Oil and Gas is based at the campus in Fort St. John. The focal point is a simulated well site training facility, which includes a decommissioned full-sized drilling rig. The facility was made possible through donations from 50 industry and community partners. Programs include industrial instrumentation, power engineering, and oil and gas field operations, and seats are in high demand, as students know they are receiving the training needed to start work in the industry.

"We have a wait-list for both oil and gas and power engineering. Oil and gas is by far the economic leader in the region, and our students know this," adds Ms. Rancourt.

The Dawson Creek campus focuses on the growing field of clean energy, through the Centre of Excellence for Clean Energy Technology, better known as Energy House. NLC offers the only Wind Turbine Technology program in B.C., and graduates can work for wind companies locally or around the world.

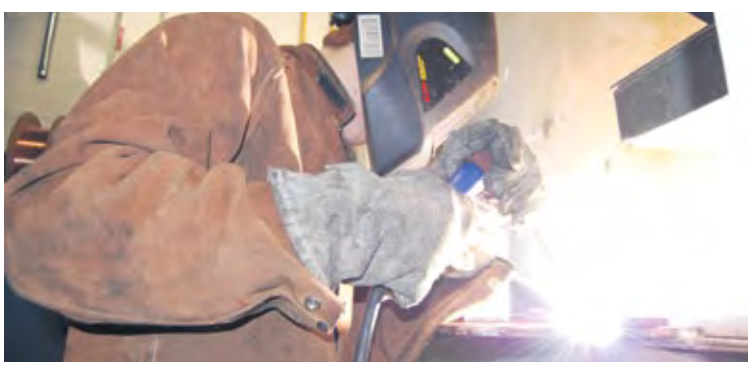
Northern Lights College's simulated well site training facility in Fort St. John, B.C., includes a decommissioned drilling rig. SUPPLIED

By the numbers

$59.4 million
Industry investment in Canada's colleges

18%
Increase in private sector investment in Canada's colleges last year

SAIT POLYTECHNIC



Organized around Alberta's industry sectors, SAIT's programs are aligned with industry labour demands. SUPPLIED

Alberta poly-tech preparing students for employment

At SAIT Polytechnic in Calgary, Alta., the direct customer is the student, but the ultimate customer is the employer, says Gordon Nixon, vice president academic.

As a result of that key guiding principle, rather than establishing traditional academic departments, SAIT has organized its curriculum around the industry sectors in Alberta: schools of energy, construction, hospitality, health, transportation, manufacturing, information and communications, and business. Further, says Dr. Nixon, "we don't hire people because of their academic credentials; we hire them because of their industry expertise. Then we provide the support mechanisms required to make them great instructors."

Industry advisory committees provide guidance on the direction of curriculum and new trends. "The expectation that our deans and academic chairs be in constant contact with industry has driven the very high employment rate of our graduates," he says.

To prepare students for immediate employment, much of SAIT's programming is hands-on training, provided on equipment similar or even superior to the most advanced equipment found in industry settings. "Our programs are very demanding, but students come to us because they know there's a huge reward at the end," says Dr. Nixon.

For example, when the Centre for Energy Asset Management needed skilled employees, it selected SAIT to develop a two-year diploma program in energy asset management. This May, the third class of 64 students will graduate. Another 32 students are enrolled in a fast-track water treatment operator program; 75 per cent of them have already been guaranteed jobs with member companies. A donation from Cenovus Energy made it possible to add an additional class of power engineering students to help replace the many power engineers expected to retire in the coming years. Additional financing from the Government of Alberta made it possible to add another class.

"Industry and government support SAIT programming, because our programming supports the economy of Alberta and Canada," adds Dr. Nixon.

CANADA'S COLLEGES

PARTNERSHIPS FOR PROSPERITY

Applied research initiatives aid growth of Canada's small and medium enterprises

As baby boomers retire and the global knowledge economy continues to emerge, Canada's future depends on bridging the increasing skills gap and growing the pace of innovation. It's a job that is too big for the Canadian people, education sector, industry or government alone. These colleges, institutes and polytechnics are demonstrating leadership in partnerships that leverage education and innovation through applied research.

SHIPBUILDING

Federal government, industry invests in trades training and applied research

Recently announced federal funding of $2.56 million will help Camosun College in Victoria, B.C., purchase essential new teaching equipment for the college's marine, mechanical and metal trades programs and enhance infrastructure and facilities for applied research and innovation.

Wärtsilä Canada, a worldwide leader in the marine and energy industry, also donated a modern 19-ton ship's engine, valued at over $850,000, to Camosun for teaching purposes.

"To be a college of excellence, for both our students and industry, we need to provide the best service, education and training equipment possible," said Tom Roemer, vice president of Strategic Development for Camosun, in the joint announcement. "This funding and equipment support will go a long way to help us deliver that in our new Centre for Trades Education and Innovation, now under construction at Interurban campus."

"Over the last year, our Government's Shipbuilding Action Plan has helped contribute to the thriving and competitive shipbuilding industry in Western Canada," added Lynne Yelich, the minister of state for Western Economic Diversification. "Today's investment supports our plan by ensuring that Canadians have the skills needed to address the demand for 30,000 skilled workers in the shipbuilding, repair and resource industries."

Funding and equipment donations are creating new opportunities for students of Camuson College. SUPPLIED

A Quebec-based research initiative promises to convert mineral residues into marketable products. SUPPLIED

NATURAL RESOURCES

Reclaiming mineral residues good for revenues and the environment

In affiliation with Cégep de l'Abitibi-Témiscamingue, the Centre technologique des résidus industriels is at work on a research initiative to reclaim mineral residues left behind by quarry extraction in Quebec's Abitibi-Témiscamingue region and convert them into marketable products, in this case muscovite and silica concentrates. The process generates extra revenue and reduces the environmental impact.

The Centre technologique des résidus industriels also worked with its industrial partners to devise a new dry process in the lab for manufacturing superior quality silica and muscovite concentrates with optimal reclamation rates and less cost than traditional wet processing.

The research results allow the partner company, Les Pierres du Nord, to explore potential North American markets for the two concentrates, thus expanding its line of marketable products while decreasing residue deposits at the quarry site itself.

"The partnership supports our plans to build a multi-purpose plant in Témiscaming that will strengthen our sustainable development efforts and inject more direct economic benefits across the region," said a spokesperson for Les Pierres du Nord.

HEALTH AND LIFE SCIENCES

A training machine that makes injured workers even stronger

Workers who have suffered shoulder injuries can now rely on a new piece of equipment that not only gets them over their injury in record time, but also gives them even more physical capability than before they got hurt. The multifunctional training machine (MTM), as it is called, can also determine the maximum physical capacity of people who have been injured.

To develop the machine, the Centre de production automatisée (CPA), affiliated with Cégep de Jonquière, teamed up with Consultants en ergonomie et mieux-être (CME), a Saguenay-region firm specializing in rehabilitation and work re-integration.

"We're truly able to bring accident victims' physical capabilities to their highest possible level!" says Martin Gravel, Consultants en ergonomie et mieux-être.

AGRICULTURE

Students play a critical role in livestock feed research at Lakeland College

In 2010, Lakeland College received $125,918 from NSERC's Applied Research Tools and Instruments grant program to purchase a GrowSafe residual feed intake monitoring system. This equipment has opened up new teaching and learning opportunities and is helping the college build relationships with industry in the region. The system measures how effectively livestock convert feedstuffs into marketable weight, and provides data to quantify the effects of various diet combinations. It also provides information on individual animals for genetic selection.

After completing installation and pilot studies in the 2011-12 school year, Lakeland has partnered with a local feedlot in the equipment's first industry-led, student-run project. "All 30 students in our feedlot class have participated in the development of this project. The data collection phase allows students to experience the research process in a very tangible way," says Geoff Brown, Lakeland agricultural sciences instructor and beef lead researcher. "Interacting with our industry partners and discussing the importance of trial design and expected outcomes really excited students about research and how they can contribute to the project."

Lakeland College's student-managed farm has extensive facilities for agriculture sciences training and research, including 1,700 acres of college-owned land. SUPPLIED

SUSTAINABLE ENERGY

Brightening up Nova Scotia's solar energy sector

Nova Scotia Community College (NSCC) recently completed a two-year study focused on improving the performance of solar thermal and solar photovoltaic systems operating in the Maritime climate. The study developed low-cost monitoring systems to quantify the performance of solar energy for heating or electrical use in the region's homes and businesses. An Innovation Enhancement grant as well as an Applied Research Tools and Instruments grant from the Natural Sciences and Engineering Research Council of Canada (NSERC) program provided funding for the college to partner with local solar energy companies.

NSERC's College and Community Innovation Program funding leaves a legacy in the form of an outdoor learning space – or solar 'classroom' – directly connected to the Applied Energy Research Lab. The new space at NSCC's Waterfront Campus gives students, faculty and researchers the opportunity to demonstrate, test and improve solar technologies while simultaneously monitoring environmental factors including incoming solar energy. The solar classroom was also made possible with support from companies such as EnCom Alternative Energy Ltd., Green Power Labs Inc., Thermo Dynamics Ltd. and Sage Energy Inc.

NSCC research scientist Alain Joseph is part of a team conducting a two-year solar panel performance study. SUPPLIED

A state-of-the-art Atonometrics solar simulator, developed by Fanshawe College, is the first of its kind in Canada. SUPPLIED

APPLIED RESEARCH

The ART(I) of supporting SMEs

Cutting-edge technology and instrumentation is building research capacity at Fanshawe College to deliver results to small and medium-sized businesses in the renewable energy, environmental, building and electronics manufacturing sectors.

Through Applied Research Tools & Instruments (ARTI) funding and the College and Community Innovation program, equipment includes a 3D scanner, EMC equipment, an infrared camera, noise and vibration measurement equipment and a state-of-the-art Atonometrics solar simulator – the first of its kind in Canada.

The ARTI program has been a boon to Fanshawe College and R&D resources in Southern Ontario. The college is already exploring new opportunities with industry for projects using the simulator and 3D scanner.

The Fanshawe College partnerships have led to three new design and development projects with other ACCC colleges, which further expands research capacity and resources to help businesses compete through development of employees with advanced skills.

RURAL ENTREPRENEURSHIP

Leveraging the agricultural advantage

Outside of Canada's urban centres, rural entrepreneurs support industry and regional economic development. As rural businesses grow, they typically depend on full-time positions with higher wages that strengthen regional economies and community capacity.

Canada has limited data on the challenges to rural entrepreneurs. To get a clearer understanding, British Columbia's Okanagan College launched a project through an Applied Research and Development grant to examine rural entrepreneurship and competitiveness.

"What we're looking at here is the industry cluster of agricultural products," said Business Division research lead Lee Carter. "Wine, tree fruits, processing, manufacturers, stainless steel fabrication, equipment manufacturing, the service and support industries, the grower supply companies – all of this is the value chain."

Investigating how agricultural competitiveness supports rural community development is of interest to business entrepreneurs, regional economic development officers, lenders and venture capitalists.