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Colleges: Open to Business



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Administrators at Canadian colleges and polytechnics are sounding happier – even if their happiness is marred by the fact that they can't move forward faster.

Colleges: Open to Business. That's our title. Take it literally! Canadian colleges are eager to collaborate with small and medium sized enterprises (SMEs). Colleges have the faculty, students and equipment to work on applied research for companies in many sectors. Already they further productivity, marketability, scalability, innovation – in short, success – for industry partners whose challenges they solve. Examples help set that scene.

ronment in our new health sciences campus. "Ocorant came to us for micro-electronics. They went away with much more. A polytechnic or college is able to offer a multi-disciplined approach to helping industry with innovation challenges."

Business innovation doesn't always aim at creating a new technology. Calgary's Bow Valley College (BVC) teamed with engineering firm WorleyParsons Canada to develop Essential Skills workplace training in partnership with the Association of Canadian Community Colleges. WorleyParsons employs many new immigrants with exceptional technical skills, but who lack Canadian workplace experience.

"This goes beyond English as a second language. It includes cultural communication, culture in the workplace, and how we structure information and processes for workflow," says BVC's Krista Medhurst, the Business Leader for Test of Workplace Essential Skills (TOWES), a widely used skills assessment test developed by BVC.

"We have used this model with the aerospace and petroleum industries, but it was the first time we had applied it at an employer's location to an immigrant population," adds Medhurst.

Before describing applied research at Algonquin College, Dr. Mark

they were marketing their system."

Algonquin's strong competency in ICT and digital media is helping bring in industry from several fields: healthcare and construction currently.

"By the end of 2012 every faculty and department will have been involved in applied research projects," says Hoddenbagh. "We engaged 500 students last fiscal year; 400 of them are engaged with in-class projects, which means that the students are working for marks in a course that is part of their study program. The student hands-on component is critical to what we do."

At Centennial College, Trish Dryden, Associate V.P. Research and Corporate Planning, names NexJ Systems as "typical of projects we work on. We are now in our fourth round of applied research for NexJ. The company is developing 'Next Generation' Enterprise Customer Relationship Management for Financial Services, Insurance and Health.

"CONII" (Colleges Ontario Network for Industry Innovation) "funded NexJ's first round of applied research with Centennial, in 2010. Then a second round with CONII escalated to involve researchers from York University. NexJ was creating online games to improve the health of diabetic patients by engaging them with games to provide timely infor-

in working with NAIT on "solutions-based research." Collaborations range from developing prototypes of robotic equipment involved in conveyor belt assembly automation, to creating a virtual museum for Metis history.

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leagues," says Morgan. "They are now working with MaRS Innovation with a second round of funding, about \$150,000 from investors."

This sort of collaboration between businesses on one side and publicly funded colleges and polytechnics on the other has produced important applied research in many industrial

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Klay Dyer, Director, novaNAIT

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Services include prototype development, validation, testing and business incubation; even helping start-ups apply for grants, patents and licences.

Partnering with the City of Edmonton to install a solar photovoltaic research system atop NAIT's roof also creates industrial opportunities. The project shares live data 24-7. "This has grown to include many start-ups and SMEs sharing expertise," says Dyer, "as well as the research and data being produced."

The Dean of Research at the Humber Institute of Technology and Advanced Learning, Dr. Patricia Morgan, describes Humber's "interest in building a culture of innovation and entrepreneurship." Towards this goal, Humber operates Innovation Humber Incubator and the New Venture Seed Fund. "Our goals," says Morgan, made setting up the seed fund "seem like a logical next step." Students compete by developing a business plan. Committees adjudicate these.

"Each young business is eligible for up to \$8,000. One first year winner was Spently.com." Designed for merchants of any size, Spently's product sends one customer, or 3,000 customers, an electronic receipt, usually by email. A receipt can be either generic, as in "10% off your next purchase," or tightly targeted, "Andrew, this deal is just for you. The next widget you buy from us will be 25% off."

"Spently has moved to the big

sectors. But never before at this rate. The pace of collaboration is gathering speed; the scale and nature of participation is growing; comfort levels and expectations on both sides are rising; and tangible rewards are winning public exposure and being discussed in influential circles.

"So why are my colleges painted with the same brush as universities, when we talk about what's wrong with the system?"

That question comes from Nobina Robinson, the C.E.O. of Polytechnics Canada and, last year, a member of the Jenkins Panel, which the government tasked to review "Federal Support to Research and Development." The Panel filed its report as Innovation Canada: A Call to Action. One part reads:

"Studies have repeatedly documented that business innovation in Canada lags behind other highly developed countries. This gap is of vital concern because innovation is the ultimate source of the long-term competitiveness of businesses and the quality of life of Canadians..."

Robinson comments, "If people understood that college-based applied research is done in collaboration with companies to solve their practical problems, then they could stop thinking of college and university research as competing against each other.

"Where that collaboration is able to happen, it's working wonderfully," she adds. "A recent OECD report ranked Canada as one of the highest investing countries in upstream ideas-generation, but we don't do enough to link applied research and industry." In September, that report, Science and Innovation: Canada, condensed that

message: "With its strong public research base, Canada could translate knowledge into commercial success more effectively."

"In the end," says Robinson, "it's about making things. We have a pure high-science culture in Canada, but we don't have an engineering culture that makes things the way Germany does. That is where specifically applied research from college to business can help."

Putting students to work on applied research for local firms often gets graduates their first jobs, too. Eighty-five percent of SMEs choosing to work with colleges are small, not medium-sized, firms. They are unlikely to have R&D departments. Trained graduates are especially important as specialist employees.

Six years ago the Natural Sciences and Engineering Research Council of Canada (NSERC) launched the College Community Innovation Program (CCIP). Canada spends \$3.1 billion on science. NSERC gets \$1.1 billion of that, of which \$35 million goes to Canadian colleges.

"That's one cent in the dollar," says Robinson. Ironically, that one cent was originally designed to position colleges within their communities, not specifically to handle applied research for local businesses. Applied research done by colleges for businesses produces output to take to market and skilled jobs.

"It's not enough," comments George Brown's Robert Luke. "Canada needs to increase its support for industry-academic applied research collaboration, including that going to colleges for applied research collaboration with businesses. What we have is a start, but demand is fast outstripping supply. We get more than 250 requests for help each year. We can accept about half."

Nonetheless, college administrators praise the people at NSERC administering CCIP. Suddenly there has been "more funding and capacity-building at provincial, territorial and national levels. It seems like a sea-change," says Centennial's Trish Dryden. "At the Association of Canadian Community Colleges conference people weren't asking 'How do we do this?' any more. They were asking 'How do we do this better?'"

What about funding? "At national level, the federal government certainly sees value unfolding, and colleges are expanding capacity in several ways," adds Dryden.

Here's one example of what has been done: the nine members of Polytechnics Canada conducted \$33.1 million of sponsored research in fiscal 2010/11. In fiscal 2011/12 that figure rose to \$44.2 million, up about one quarter in a single year. That figure from just nine colleges is larger than the total amount distributed by NSERC's CCIP program. Now, if governments were to prime the college pump a little more, what might be possible across this land?

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Mark Hoddenbagh, Director, Applied Research and Innovation, Algonquin College

Ocorant Inc. makes heart-monitoring vests that people wear while moving around. Electrodes monitor a patient's chest, recording cardiac data which the wearer reports by phone to a doctor's office. Ocorant approached George Brown College for help making the sensors. That was just the start of collaboration. Dr. Robert Luke, George Brown's Assistant V.P. Research and Innovation, explains:

"We have a significant fashion design program, so we were also able to help Ocorant design a vest to position the sensors and technology comfortably. Our engineering faculty and students worked on the microelectronics; fashion students built the garment. Then we linked Ocorant to students in our nursing program. They tested the vest on people in the simulated home envi-

Hoddenbagh reminded us that a college's priority is to enhance student education.

Hoddenbagh, Algonquin's Director Applied Research and Innovation, described the college's work with Impakt Protective. This company designs sports helmets to make it easier to detect whether an athlete may have suffered a concussive blow. "Impakt Protective was working on a sensor and accelerometers you could put into a sports helmet to detect the force and direction of a blow," says Hoddenbagh. "The system calculates whether an event may be concussive. That way you can get the person to treatment right away.

"Algonquin linked Impakt Protective with a software developer and a wireless specialist – two professors, each working with two students. In less than six months of work with us

mation – to help them make informed choices. Then we did some Flash-based prototypes to give NexJ an idea of how their system would work.

"Now we are among sixteen partners working with NexJ and York University on a \$15.5 million grant under FedDev's Technical Development Program." The overall purpose: to build a new people-centred and technology-enabled system that will allow people to better manage their own health and more easily connect with health and wellness professionals, an integral part of Canada's focus on health and wellness.

In a number of sectors, Centennial is seeing its partner industries "sending us their suppliers as well."

Five years ago Edmonton's Northern Alberta Institute of Technology (NAIT) launched novaNAIT, a one-stop shop for industries interested