College Applied Research Grows SME Innovation

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In Calgary, college students have helped an entrepreneur develop a compact energy-efficient hot water boiler. In Ottawa, a builder is providing award-winning shelters to disaster areas, thanks to the efforts of engineering students at a local college. And in Toronto, Game Design faculty and students at a leading college are helping a high-tech start-up to access much-needed venture capital by proof-of-concept work that completed the animation and integration of a game designed to help children with learning disabilities. Such applied research success stories demonstrate concretely how Canada's under-tapped colleges are contributing to innovation success in meaningful ways.

Colleges help small- and mid-sized enterprises (SMEs) solve a variety of challenges, from the design and prototype stages of new products to their commercialization. Overcoming these innovation hurdles are undoubtedly among the major obstacles facing Canada's business sector today.

For their part, Canada's colleges consider contributing to the country's economic success to be an integral part of their 21st century mission. At Polytechnics Canada – an alliance of nine leading research-intensive, publicly funded colleges and institutes of technology in key economic regions – and at other leading colleges, we foster economic growth through applied research that addresses commercial needs. Our research is driven by industry requirements, not by academic curiosity. And being close to our clients, we deliver business results quickly and efficiently.

When the recently concluded Federal R&D Review Panel held consultations across the country, SMEs told us many revealing things:

• speed-to-market is their principal challenge because government does not adequately support "demand-driven" innovation (since so much funding is focused on the "idea-push" model of pushing invention out to consumers);

• most firms, with an average size of half a dozen employees, do not have in-house R&D talent or facilities; and

• financing and capital are difficult to obtain in the time needed.

Many identified the commercialization gap as critical – the vital near-to-market stage when products, processes and service innovations need to be tested, scaled-up or re-tooled. But this is where colleges can play the role of innovation intermediaries or innovation "midwives," to coin a phrase. We bridge the "death valley" between pure research and commercial problem-solving. That bridge leads to economic growth and jobs. Few other institutions performs that role. Yet, the predominant federal response to spurring innovation has been to support discovery and breakthrough research, enticing companies to collaborate on large-scale, multi-year academic research projects with universities.

Clearly, we need to grow the number of innovative firms. Of Canada's 1.1 million SMEs, less than 20 per cent invest in R&D. This number must grow.

More than a decade ago, applied research projects emerged as a by-product of the training colleges performed for local firms and employers to meet their labour market demands. Armed with the ability to offer high-quality, technology-intensive undergraduate degrees, Polytechnics Canada members, along with other leading colleges, began integrating these research projects into their curricula. As a result, college students have learned to apply their knowledge as they complete their academic credentials.

Now, companies approach colleges for applied research and business innovation assistance services. In response, Canada's largest colleges and polytechnics are showing an increasing research-intensity, operating research enterprises that are leveraging both government and private investment.

Since 2008, Polytechnics Canada's members have serviced more than 2,500 SMEs, conducted nearly 1,200 applied research projects to solve industry-identified problems, involved some 13,500 college students in hands-on applied research projects and developed 560 prototypes for their industry partners.

Federal recognition of these growing trends has been slow and disparate, often supported through small-scale pilot projects. However, through recent programs such as NSERC's College Community Innovation Program, FedDev Ontario's Applied Research and Commercialization Initiative and announcements such as the NRC's new Industrial Research Assistance Program for ICT adoption, modest support is being provided to connect the applied research talents and facilities of colleges and polytechnics with the business needs of SMEs. Even through these very recent programs over 500 firms have increased their R&D exposure and activity. The time has come to strengthen these programs and think of new ways to support SME innovation, through programs with proven track records such as commercialization vouchers that enable firms to choose the commercialization service provider of their choice.

And now, a new trend is emerging where successful applied research projects at colleges are creating new positions at the client firms that are then filled by the very students who were working on the projects. In this way, college students are not just being trained to fill jobs vacated by baby-boomers leaving the workforce; they're creating new, high-quality, sustainable jobs that the economy needs. Our graduates have the entrepreneurial talent so needed by small firms to grow commercial success. This is "demand-driven" innovation in action – one effective, albeit under-utilized, way to grow SME innovation and productivity in Canada.

Nobina Robinson is CEO of Polytechnics Canada and a member of the Federal Expert Review Panel on R&D, which issued its report in October.