

Six strategies for Canadian universities to foster innovation

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Experts from within and outside of academia expound on what role universities can play to further the innovation agenda.

The buzzword “innovation” might perk you up – or make your eyes roll. Regardless of how the term sits with you, innovation is clearly on the [federal government’s agenda](#) and of big interest to universities as they try to keep pace with rapid changes in society and the economy, while staying responsive to [government funding priorities](#) and continuing to meet the needs of their students, faculty and the wider community.

With the federal government grappling with weak economic growth and working on crafting a new “[innovation agenda](#),” (PDF) we asked six experts inside and outside the academy what role they think universities should play in fostering greater innovation in Canada. Their innovation definitions differ in their wording, but are variations on the theme that innovation is not about inventions, per se, but about the novel use of inventions and technologies that lead to transformative new or improved services, products and processes. Universities already make substantial contributions through their teaching, learning and research functions, and have at least some role to play in the innovation ecosystem, they agree, but how far that should go and in which ways yielded intriguing ideas from each of them.

The two-stream solution

“We should foster a culture of risk-taking. Universities are traditionally oriented towards success, but experience tells us most ventures fail.”

Joy Johnson, vice-president, research, Simon Fraser University

Innovation comes from two streams. One is a really novel idea somebody has. The other is through the deep, committed research that happens in laboratories over many years. Universities foster both. We are incubators of ventures and of entrepreneurs, and are a key part of the innovation ecosystem.

We can support innovation by being willing to work with industry as partners and having our researchers work closely to solve key industry issues, rather than looking for places where university discoveries can be plugged in. An example is SFU's [4D Labs](#), our material sciences lab. It's a state-of-the-art facility, open to industry to come and have a developmental problem solved, either by having us do the work or working together to figure out what the issue is.

Universities play a key role in the mobilization of knowledge. They can ensure all students have the chance to gain entrepreneurial experience, and they can develop facilities and supports for students and faculty to incubate and accelerate their great ideas into sustainable business ventures. SFU's [Venture Connection](#) student business incubator and [Venture Labs](#), our business accelerator, are two examples.

Innovation isn't for everybody. There will always be a need for fundamental research that yields knowledge that is not immediately commercializable. But for those researchers who develop ideas that could be commercialized, who need unique intellectual property protected, who could contribute to society through the scale-up of ventures, we need to help them figure out how to do that. This is an equally important mission of the university, to develop supports to foster this work. At the same time, what will count in all of this is success; we need to look at how to measure that.

We should foster a culture of risk-taking. Universities are traditionally oriented towards success, but experience tells us most ventures fail. Unless people take chances, innovation won't happen. Our social innovation lab [RADIUS](#) (RADical Ideas, Useful to Society) holds a "[Social Venture Failure Wake](#)" to celebrate the many failures that come with trying new things and learning from them. That's another area universities can embrace: social innovation, which is about new ideas that produce value for the world, even if they don't generate profits.

Producers of new knowledge

“Canadian universities have done very well, but they should not tell government that they are the solution to Canada’s broken innovation system.”

Dan Breznitz, co-director of the innovation policy lab and Munk Chair of Innovation Studies, Munk School of Global Affairs, University of Toronto.



Universities have a role to play in fostering innovation but they cannot be the engine of innovation. They can and should be the producers of new knowledge; that should be their main goal.

Universities can be places where a lot of research that might eventually become innovation happens. But, they are not the research lab of big corporations. They can be places where companies might start but then equally important is acting as partners in innovation with already established firms. They can provide collaborative public space for innovation.

Universities educate the people who technically innovate as well as the people who can conceptualize innovation. We idolize engineers, but Steve Jobs was **not a great engineer**. He had a liberal arts education that allowed him to understand himself and others and, with a deep technical knowledge, how human beings could use technology to do certain things. We need to ensure that social sciences and humanities students graduate with a better appreciation of technology and innovation: how it happens, its role in society and how to apply what they know to make technical things useful by developing them into systems.



Universities should be allowed to use their research capabilities to address tricky policy questions such as intellectual property rights, incubation and all the rest. They should be judged much more in terms of their very broad impact on innovation, not by the number of patents they have or the money they earn in licensing fees. I'd like to see more research projects that look at that.

Canadian universities have done very well, but they should not be expected to be – nor should they tell government that they are – the solution to Canada's broken innovation system. The only thing that will lead to, besides slightly more budget, is that they will be responsible for a role they are ill-equipped to fulfil and will fail at – and then there will be a political backlash. I think we promise too much already.

From start-ups to scaling up

“Having built the science infrastructure, we now have to complement that with business experience and acumen.”

Micheál Kelly, dean, Lazaridis School of Business and Economics, Wilfrid Laurier University

The end goal of our innovation policy should be the creation of globally competitive, Canadian technology companies that compete on the basis of innovation.

When you talk to universities about what they are doing to foster innovation, generally you hear a lot about innovation research and development, academic research, the commercialization of research, nurturing entrepreneurship and the start-up culture. We need to take it further.

Start-ups can't be the end game. They really don't create jobs; they churn jobs. Our business school feels our focus needs to be on the challenges companies face as they scale up, grow and try to become globally competitive. These are management issues, not technology issues. Our Lazaridis Institute for the Management of Technology Enterprises is [launching a program this November](#) aimed at giving C-level executives of promising Canadian start-up companies the skills and insights to build their businesses to a global scale. It will be taught by experts who have done it themselves and we plan to take what we learn from that program and integrate some of it into our regular business school offerings.



Innovation policy is not just about the science, technology, engineering and math (STEM) disciplines. Business schools have to be seen as an important part of the mix. Along with that, universities need to pay attention to the complementarity between their science and engineering programs and their business programs. The crosswalks aren't always well-established, but they are important. Universities are still the prime source of research and development in this country and there is some really interesting stuff coming out of universities. Having built the science infrastructure, we now have to complement that with business experience and acumen if we're really going to grow these companies here, in Canada, to provide employment opportunities and create wealth.

A focus on graduate skills

“We should be careful not to blow up the university system trying to do something it wasn't designed to do.”

Daniel Munro, associate director, public policy, Conference Board of Canada

There are many things we can do to get universities to contribute more to innovation. They are a big slice of the issue, but they're just a slice. Canada's innovation agenda shouldn't put universities at the centre. Moreover, we should be careful not to blow up the university system trying to do something it wasn't designed to do. Governments need to think less about what kinds of inputs can spur innovation at universities and more about the mechanisms through which great university research and research skills can be better integrated into the innovation ecosystem.

That said, universities could shift the culture of graduate education to one that recognizes that the real purpose of a PhD is to educate researchers, deep thinkers and creative problem-solvers, and that most will go on to careers outside the academy. Beyond workshops to provide graduate students with career and professional skills, there are models, such as the innovation partnership organization Mitacs, which give graduate students the chance to apply their research skills to problems in the private and social sectors. Europe has examples where PhD programs have been completely restructured, such as the “industrial PhD,” where students are more directly linked to industry and other non-academic research experiences and career paths.



Canada lags in innovation management skills. Universities could explore ways to offer education to students across disciplines, through additional courses, co-ops, internships and other experiential learning to develop these skills. It's important for students to first get a grounding in a discipline before acquiring management skills. Programs like the [Master of Management of Innovation](#) at the University of Toronto at Mississauga strike me as promising in that they supplement, rather than replace, education in a core discipline. (Queen's University offers a similar program.)

Much successful innovation will draw on technical skills and scientific knowledge, as well as on understandings of human psychology, behaviour and design. Students comfortable with both science and the social sciences and humanities will likely contribute more to addressing future innovation challenges and opportunities, so working harder to ensure cross-disciplinary learning for students would be helpful.

It's not about the patents

“The most powerful things universities have contributed to innovation are the ideas, processes and design elements that we impart to our students.”

Peter Phillips, political economist, Johnson-Shoyama Graduate School of Public Policy, University of Saskatchewan and co-author of Canadian Science, Technology and Innovation Policy

I don't accept that universities should have a major role in promoting Canadian innovation, although they have an indirect role. They're the conservators, the transmitters and the creators of some of the foundational and critical knowledge that drives the socio-economic system. But they're constitutionally designed not to be in the commercial space, because universities are all about excellence, which slows things down – commercialization is all about bootstrapping.

Most universities don't cover the costs of their tech transfer or industry liaison offices through the cash returns on intellectual property. You need a big intellectual property portfolio to have a good chance of succeeding and most Canadian universities are too small. In the bio-science space, only about four universities in North America, out of about 650, are large enough to cover their expenses. Of the groups that are high-impact, many aren't part of the formal academy; they're in their own research enclaves. An example is the [Crop Development Centre](#)

(founded in 1971 with a mandate to improve economic returns for the Western Canadian agriculture industry), based at the University of Saskatchewan. Scientists integrate basic research with the genetic improvement of



various crops, applying themselves to problems that the industry needs answers to. Their returns on investment are phenomenally successful. So we are doing this, but these are purpose-built relationships.

Teaching and research are core to any conversation about innovation and the postsecondary space. If we don't do those then it doesn't matter what we do in knowledge translation, we're not doing our job. Knowledge translation should be a part of it, but exceptionalizing things that can be protected by property and then exploited through commercial transaction is problematic. It doesn't mean we shouldn't do that, it just means that's not all we should do. I would argue the most powerful things universities have contributed to innovation are the ideas, processes and design elements that we impart to our students – who then translate those into the economic, social and political spaces they enter after they leave us – and through our research done directly with our partners that changes and sometimes creates whole new sectors. Few of those are directly patentable by industry liaison offices.

Eroding the Ivory Tower

“[We need] more opportunities for students across disciplines to learn by doing, challenging existing learning structures and models of education.”

Wendy Cukier, professor of information technology management at Ryerson University and co-author of Innovation Nation: Canadian Leadership from Java to Jurassic Park

Universities are central to the innovation ecosystem. While fundamental and discovery-based research is critical to pushing the envelope, excellence and relevance are not mutually exclusive. Researchers should be encouraged to work with partners to solve real-world problems and the reward system must reflect this. Instead of hoping that research will move from lab to marketplace, we need systems that actively prospect for commercialization opportunities. This requires a coherent strategy from government, granting agencies and universities as well as a change in the structures that will respond to it. Universities need better platforms for exchanging information about who has ideas, who has needs and who has capacity to commercialize and drive change.



While innovation discussions tend to focus on STEM, which are fundamental, they miss the important role our social sciences and humanities departments could play in understanding the factors that drive or impede the adoption of new technologies and processes. That's a huge blind spot. Innovation requires that we do things differently. The adoption of technologies is shaped by human behaviour, organizational issues, public policy, law and the content they transmit – all within the social sciences and humanities domain.

Universities cannot drive innovation without practicing what they preach. That means eroding the Ivory Tower so that we work with the private sector, government and communities to meet society's needs, offering more opportunities for students across disciplines to learn by doing, challenging existing learning structures and models of education. Universities still teach much as they did in the Middle Ages – a typical class is still lecture-based – and there remain those who prefer to preserve the separation between “town” and “gown.” Often class scheduling is dictated by what works for administrative systems rather than by what works for learners.

Whether students become successful entrepreneurs or not, they will help drive the cultural change we need. We need more opportunities for students to learn these skills within or outside their formal curriculum, such as [Ryerson's DMZ](#), an incubator which was created outside the traditional academic structure. These pilot projects can

create and test new models for learning that are later integrated into the formal academic curriculum.