



TRANSFORMATIONAL GAINS

WHAT CANADA NEEDS
TO STRENGTHEN INNOVATIVE
CAPACITY AND GLOBAL
COMPETITIVENESS

FEBRUARY 2019





ABOUT PPF

Good Policy. Better Canada. The Public Policy Forum builds bridges among diverse participants in the policy-making process and gives them a platform to examine issues, offer new perspectives and feed fresh ideas into critical policy discussions. We believe good policy is essential to making a better Canada—a country that's cohesive, prosperous and secure. We contribute by:

- Conducting research on key issues
- Convening candid dialogues on research subjects
- Recognizing exceptional policy leaders

Our approach—called **Inclusion to Conclusion**—brings emerging and established voices to policy conversations in an effort to inform policy-makers and identify policy options and obstacles. PPF is an independent, non-partisan think tank with a diverse membership drawn from private, public, academic and non-profit organizations.

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INTRODUCTION

Global events are creating unprecedented opportunities for Canada to attract capital, talent and companies. As other countries turn inward, Canada's receptiveness to expanding trade and attracting foreign investment is a welcome one in today's global environment. Canada's commitment to openness on the world stage is an increasingly attractive one. And, in an age of disruptive technological advances, Canada's world-leading research and highly regarded graduates provide a competitive advantage and significant magnetic pull for investment.

At the same time, global events are challenging the status quo in Canada. For decades, Canada's prosperity was built on competitive corporate tax rates, liberalized trade policies and the export of resources. These foundational elements are now being challenged by a range of different factors. The United States recently lowered its federal corporate tax rate below Canada's. Amid growing discontent about inequality, citizens and governments around the world are challenging globalization and free trade. Canada faces significant barriers in exporting commodities, including trade disputes limiting softwood lumber exports and the lack of energy infrastructure impeding access to competitive markets.

While there is reason to be optimistic about the prospect of continued economic, social and cultural growth, the status quo is no longer viable.

What, then, must Canada do to best position itself to seize this moment and strengthen our innovative capacity, global competitiveness and economic and social fabric?

That was the topic of conversation at forums held across Canada from November 2017 to February 2018 as part of a project led by the Public Policy Forum (PPF) in partnership with Dalhousie University, McGill University, The University of British Columbia, University of Calgary and University of Toronto. PPF and the universities convened business, community and academic leaders for roundtable discussions in Halifax, Montreal, Ottawa, Toronto, Calgary and Vancouver.

Three foundational priorities emerged:

1. Canada must increase its focus on developing well-educated, highly skilled people who can tackle our toughest challenges, because a strong talent pool is critical to attracting investment, growing businesses and driving job creation;
2. Canada must build connective tissue along the entire innovation and entrepreneurial supply chain, because though Canada has many of the right components, it is often missing linkages between those components; and,

3. Canada must act quickly and boldly. Having received advice from blue-ribbon panels in the past year on how best to support fundamental science and drive competitiveness, government and the broader community have both the data and insights necessary to move forward. What's required now is a commitment to implement and build on these findings.

On these foundational priorities, we most frequently heard the following recommendations from across the country:

- 1. Make Canadian research globally competitive.**

- Continue strengthening the foundations of research;
- Increase support for the institutional costs of research;
- Reinvigorate support for graduate students.

- 2. Co-ordinate skills development better.**

- Revamp curricula and deliver more work-integrated learning opportunities;
- Prioritize entrepreneurial skills development;
- Further enable collision spaces, incubators and innovation marketplaces.

CURRENT CONTEXT

Global events have opened a window of opportunity, and the status quo is no longer viable, but is Canada ready and willing to act? There are many positive indicators:

University of Toronto (U of T) president Meric Gertler points to recent decisions by some of the world's leading knowledge-economy companies to invest in Toronto, Montreal, Edmonton, Vancouver and Halifax. Firms such as Google, Facebook, Uber, Microsoft, Amazon, Tesla, Thomson Reuters, Huawei, Fujitsu Laboratories, Johnson & Johnson, GE Healthcare and Bayer have been drawn to these cities recently. Their investments were not prompted by tax incentives, but by the local concentrations of unique research expertise, highly educated graduates and high quality of place.¹

Yung Wu, CEO of MaRS Discovery District, noted a similar magnetic draw on the talent front, saying: “For the first time in my career, we are seeing the north-south brain drain flow in the opposite direction.”² Wu noted that 30 per cent of job applicants to MaRS ventures and tenants are now coming from the United States. He credits Canada's values of openness and tolerance, the globally recognized momentum within our tech sector, and the increasing concentration of top talent as key reasons for this welcome reversal of the southward brain drain. “While we can feel justifiably proud, we can't ease back on the accelerator,” Wu argues. “We are in a global tech race, and if we cannot rapidly commercialize the breakthroughs coming from our world-leading universities, someone else will sell them back to us.”³

That sentiment of urgency to keep pressing on the accelerator — and pressing it even harder — is one we heard from business, community and academic leaders throughout the country. One business leader summed it up well, saying: “For generations, Canada has succeeded by watching and following rather than taking risks. That's not good enough anymore.”

Nonetheless, several assessments of Canada's innovative capacity appear to indicate the answer to whether Canada is ready and willing to seize the moment may be “no”. In fact, as one observer recently noted, there are many indications “our country is suffering from an innovation crisis, and it's getting worse every year”⁴:

¹ Gertler, M. Opening remarks at the Public Policy Forum's *Transformational Gains* symposium in Ottawa, Feb. 1, 2018.

² Wu, Y. Keynote remarks at the Public Policy Forum's *Transformational Gains* symposium in Ottawa, Feb. 1, 2018.

³ Ibid.

⁴ Kaplan, M. Feb 16, 2018. [Canada is lagging on innovation — and the Liberals aren't helping](#); Maclean's.

- Bloomberg's [2018 Innovation Index](#) ranked Canada in 22nd place, down from 20th place last year,⁵ and 12th place just three years ago:⁶
 - Bloomberg's index considers R&D intensity, productivity, high-tech density, researcher concentration, manufacturing capability, tertiary efficiency and patent activity.
 - While Canada's highest ranking is in researcher concentration,⁷ Canada does not crack the top 10 in any of the above metrics.
 - Notably, Canada ranks 45th on tertiary efficiency, a combination of factors related to talent generation, with emphasis on science and engineering graduates.⁸

- The [2017 Global Innovation Index](#) (GII) ranked Canada 18th,^{9,10} a three-place decline from last year,¹¹ and a 10-place decline from 2011:¹²
 - The GII examines 81 indicators, divided between innovation inputs and outputs. Canada ranks 10th overall on inputs, but 23rd on outputs.
 - On inputs, Canada shows particular strength in market sophistication¹³ (3rd) and institutions¹⁴ (7th).
 - While Canada has slightly improved in human capital and research¹⁵ (20th), several components within that indicator remain problematic, including a 22nd-place showing in "gross expenditure on R&D as a share of GDP" and a 40th-place showing in "expenditure on education as a share of GDP."
 - Canada lost ground in business sophistication (24th), which measures how conducive firms are to innovation activity. An important component of this is "innovation linkages," for which

⁵ Jamrisko, M. and Lu, W. Jan 22, 2018. [The U.S. Drops Out of the Top 10 in Innovation Ranking](#); Bloomberg.

⁶ Coy, P. [The Bloomberg Innovation Index](#); Bloomberg.

⁷ "Researcher concentration" accounts for the total number of professionals, including post-graduate students, employed in R&D projects per capita.

⁸ "Tertiary efficiency" takes into account: total enrolment in tertiary education, regardless of age, as a percentage of the post-secondary cohort; percentage of the labour force with tertiary degrees; and annual new science and engineering graduates as a percentage of total tertiary graduates and as a percentage of the labour force.

⁹ Dutta, S., Lanvin, B. and Wunsch-Vincent, S. (Ed). 2017. [The Global Innovation Index 2017: Innovation Feeding the World, Tenth Edition](#), p. xvii: Report. Cornell University, INSEAD, and WIPO.

¹⁰ The GII was released in June 2017 by Cornell University, INSEAD and the World Intellectual Property Organization.

¹¹ Ibid., interactive database. <https://www.globalinnovationindex.org/analysis-indicator>.

¹² Dutta, S., Lanvin, B. and Wunsch-Vincent, S. (Ed). 2017. [The Global Innovation Index 2017: Innovation Feeding the World, Tenth Edition](#), p. xviii. Report. Cornell University, INSEAD, and WIPO.

¹³ "Market sophistication" includes the ease of getting credit, domestic credit to the private sector, market capitalization, venture capital deals, intensity of local competition, domestic market scale, and applied tariff rate.

¹⁴ "Institutions" includes political stability, government effectiveness, regulatory quality, rule of law, and ease of starting a business, resolving insolvency and paying taxes.

¹⁵ "Human capital and research" includes education, tertiary education and research and development.

Canada's standing plummeted from 7th to 27th between 2011 and 2017, due in part to “a decline in university/industry research collaboration.”¹⁶

- The GII also notes that, unlike many competitor countries, Canada's business enterprise expenditure on R&D remains below levels seen during the financial crisis of 2008-09.¹⁷
- Canada's ranking on innovation outputs is dragged down by particularly poor showings on new business density¹⁸ (61st) and labour productivity¹⁹ (75th).

▪ The [Education at a Glance Report](#) from the Organisation for Economic Co-operation and Development (OECD) looks at the state of education around the world:

- The report shows 61 per cent of Canadians between the ages of 25 and 34 have a post-secondary qualification, the highest share of all OECD countries after Korea (70 per cent). This statistic is frequently and understandably touted as a success.
- But it also reveals that Canada lags in graduate studies. Just 10 per cent of Canadians between 25 and 34 have completed a master's degree or doctorate, compared to the OECD average of 15 per cent.²⁰
- Notably, Statistics Canada data shows the importance of immigration in maintaining Canada's cohort of master's and doctoral students: just five per cent of the Canadian-born population have earned a master's degree or doctorate, compared to 11 per cent of all immigrants and 17 per cent of recent immigrants (those who arrived within the last five years).²¹

¹⁶ Ibid., p. 25.

¹⁷ Ibid., p. 6.

¹⁸ “New business density” takes into account the number of new firms, defined as firms registered in the current year of reporting, per thousand population aged 15-64 years old.

¹⁹ “Labour productivity” focuses on the growth of gross domestic product (GDP) per person engaged (defined as output per unit of labour input).

²⁰ Ibid., p. 2.

²¹ Statistics Canada. [Education in Canada: Key results from the 2016 Census](#), p. 6. Nov 29, 2017: Statistics Canada.

RECOMMENDATIONS

MAKE CANADIAN RESEARCH GLOBALLY COMPETITIVE

Continue strengthening the foundations of research

There has been a lot of talk about fundamental science over the last year. This is not surprising, given the high-profile nature of the [April 2017 report](#) from the Fundamental Science Review Panel, chaired by former University of Toronto president David Naylor (this report is referred to as the “Naylor Report” throughout this report).²² Fundamental research is tremendously important as a driver of innovation, but especially as a producer of talent. New platform technologies, patents and products are critical to Canada’s economic success, and investigator-led research leads to remarkable, unpredictable and often unrelated discoveries. Canada must do more to produce new knowledge and discoveries, yet developing well-educated, highly skilled people who can tackle our toughest challenges is equally critical to developing new patents and products — as is attracting and retaining them. Canada has a competitive advantage in this regard, which it should seek to protect by promoting inclusive, vibrant and liveable communities. It follows that a strong talent pool is essential to attracting investment, growing businesses, and driving job creation.

Fundamental science can play a much bigger part in training the next generation of talent. In fact, support for fundamental research and training can help Canada train the next generation of knowledge workers more broadly, as University of Calgary president Elizabeth Cannon affirms:

“Investments in research help train students, both graduate and undergraduate, to become not just academics but also the next drivers of industry, and leaders in government and entrepreneurship.”²³

But fundamental and applied science should not be pitted against one another. Rather, both fundamental and applied science are highly valuable and we need a substantial, long-term infusion of stable financial commitments to Canada’s overall science-funding envelope so our country can make up for lost ground and be globally competitive.

The 2018 federal budget made important advances in this regard by investing significantly in science and research. The budget included \$925 million in new funding for investigator-led research through Canada’s granting councils over the next five years. It included a commitment of \$275 million over five years to support research that is international, interdisciplinary, fast-breaking and higher-risk. And it included a \$540-million investment in the National Research Council and a renewal of federal laboratories.²⁴

²² Fundamental Science Review Panel. [Investing in Canada’s Future: Strengthening the Foundations of Canadian Research](#), 2017: Science and Innovation Canada.

²³ Cannon, E. [Canada can’t afford to lose a generation of top research talent](#), April 28, 2017: The Globe and Mail.

²⁴ Honourable William Francis Morneau. [Budget Plan. Equality Growth: A Strong Middle Class](#), 2018: Government of Canada.

Undoing the damage of years of neglect was critical and the federal government deserves credit for that, but the job is not done. To be globally competitive and to strengthen Canada's innovative capacity and economic and social fabric, further investments will be needed in the years ahead to strengthen the foundation of Canadian research. After all, as Cannon said at our Ottawa forum: "We may not know what the next big thing is, but I can guarantee you it's being researched in our universities today."²⁵ It is essential that Canada continues to strengthen the foundations of research.

Improve collaboration with industry and increase support for the institutional costs of research

More attention is required to effectively collaborate with industry and address the costs of commercializing technologies arising from research.

"[T]o be effective partners in innovation, universities must engage in knowledge translation, manage intellectual property, and partner with for-profit and non-profit enterprises. Without comparable levels of funding, Canadian institutions will never be able to compete successfully with the technology transfer record of U.S. universities."²⁶

The most recent [Global Innovation Index](#) showed: Canada's standing plummeted from 7th to 27th place on "innovation linkages" between 2011 and 2017, due in part to "a decline in university/industry research collaboration."²⁷ We must reverse this trend and ensure our universities and research institutions have what they need to be effective partners with industry. This means that government must properly contribute to the institutional costs of research.

Bloomberg's [2018 Innovation Index](#) showed: Canada is in 45th place on tertiary efficiency, a combination of factors related to talent generation, with a particular emphasis on science and engineering graduates.²⁸ That, combined with our 40th-place showing in "expenditure on education as a share of GDP" in the Global Innovation Index,²⁹ drives home the point that Canada cannot afford to force its universities to redirect resources intended for teaching, learning and talent generation to cover institutional costs of research. If government support for research does not adequately contribute to the institutional costs of research, universities will continue to be forced to rely on tuition dollars and provincial grants to cover such costs, which strains the critical mission of teaching, learning and talent generation.

²⁵ Cannon, E. Remarks in panel discussion at the Public Policy Forum's *Transformational Gains* symposium in Ottawa, Feb. 1, 2018.

²⁶ Fundamental Science Review Panel. [Investing in Canada's Future: Strengthening the Foundations of Canadian Research](#), p. xxii. 2017.

²⁷ Dutta, S., Lanvin, B. and Wunsch-Vincent, S. (Ed). 2017. [The Global Innovation Index 2017: Innovation Feeding the World, Tenth Edition](#), p. 25. Report. Cornell University, INSEAD, and WIPO.

²⁸ "Tertiary efficiency" takes into account: total enrolment in tertiary education, regardless of age, as a percentage of the post-secondary cohort; percentage of the labour force with tertiary degrees; and annual new science and engineering graduates as a percentage of total tertiary graduates and as a percentage of the labour force.

²⁹ Dutta, S., Lanvin, B. and Wunsch-Vincent, S. (Ed). 2017. [The Global Innovation Index 2017: Innovation Feeding the World, Tenth Edition](#), p. 25. Report. Cornell University, INSEAD, and WIPO.

While the 2018 federal budget allotted an additional \$231 million over five years for the Research Support Fund (RSF),³⁰ which helps cover the costs of facilities and administration, this is simply in line with the overall increase in research grants. To better support the necessary institutional costs, the Naylor Report called for a staged increase in RSF funding to 40 per cent of the value of research grants, but the federal government maintained the status quo in terms of the percentage of RSF funding. Currently, the average reimbursement rate for institutional costs of research is 21.6 per cent of eligible direct operating costs, and the process for determining coverage is “formulaic and arbitrary.”³¹ That is a stark contrast to the reimbursement rate for institutions in the United States, which runs between 40 and 60 per cent and is based on actual audited costs.³²

REINVIGORATE SUPPORT FOR GRADUATE STUDENTS

Reinvigorate support for graduate students

Graduate students are integrally involved in nearly all university research and they are precisely the people we are seeking to instil with the knowledge and skills to tackle our toughest challenges. Recall the statistics discussed earlier: Canada lags behind the OECD in the proportion of the population with master’s degrees and doctorates. Financial support is critical to encourage more Canadians to pursue advanced degrees. The increased funding for research announced in the 2018 federal budget will result in more stipends for graduate students, and that is a positive development for the talent agenda. But scholarships play a critical role as well, and the number of core graduate awards has not increased since 2007, despite significant enrolment increases. The value of graduate awards has also remained unchanged since 2003, with inflation-adjusted spending on master’s scholarships decreasing since 2006–2007 and spending on doctoral scholarships remaining stagnant overall, despite the creation of the [Vanier awards](#).³³

In its 2018 budget, the federal government committed to “further work” on this issue. That work is of utmost importance. Subsequent budgets should include increased support for graduate students to strengthen the foundation of Canadian research and bolster the talent agenda.

³⁰ Honourable William Francis Morneau. [Budget Plan. Equality Growth: A Strong Middle Class](#). 2018: Government of Canada.

³¹ Fundamental Science Review Panel. [Investing in Canada’s Future: Strengthening the Foundations of Canadian Research](#), p. xxii. 2017.

³² Ibid., p. xxii.

³³ Fundamental Science Review Panel. [Investing in Canada’s Future: Strengthening the Foundations of Canadian Research](#), p. 139. 2017.

ACHIEVE BETTER CO-ORDINATION ON SKILLS DEVELOPMENT

Reinvigorate curricula and deliver more experiential and work-integrated learning opportunities

At the roundtable in Ottawa, Dalhousie University president Richard Florizone argued for the importance of work-integrated learning (WIL) in “building the connective tissue,”³⁴ pointing out that such programs allow students to gain practical skills, bring them back to the classroom, help drive changes to the curriculum, and strengthen linkages between academia and industry.

Opportunities for WIL need to be expanded.

Current programs developed and driven by Mitacs are doing this to a large extent but are also considered to be near capacity. To meet recommendations from the [Business-Higher Education Roundtable](#) on achieving 100-per-cent participation in WIL, we will need a more concerted approach between federal and provincial governments on mitigating challenges and promoting the development of “high-quality, high-value WIL experiences across the post-secondary spectrum.” This approach will need to include adopting a standard definition of WIL, improving data collection, building an evaluation mechanism and co-ordinating efforts between stakeholder groups.³⁵

The importance of addressing this goes beyond an attempt to mitigate the perceived “skills gap” that is aptly captured in the 2015 [Future-proof](#) report by Brookfield Institute for Innovation + Entrepreneurship. Their report revealed a significant disconnect in perceptions, with 83 per cent of Canadian education providers believing youth are adequately prepared for the workforce, but just 44 per cent of youth and 34 per cent of employers feeling the same way. According to the Brookfield Institute, this could suggest a need for employers to play a stronger role in providing workplace-relevant training programs that complement post-secondary education. However, Canadian employer investments in skills training are slowing: between 1993 and 2013, the amount that Canadian employers invested in employee training declined by 40 per cent.³⁶

Brookfield’s recommendations³⁷ included:

- Developing work-integrated learning (WIL) models applicable to different sectors;

³⁴ Florizone, R. Remarks during a panel discussion at the Public Policy Forum’s *Transformational Gains* symposium in Ottawa, Feb. 1, 2018.

³⁵ Academica Group. [Business/Higher Education Roundtable: Taking the Pulse of Work-Integrated Learning in Canada](#), p. 66.

³⁶ Lamb, C. and Doyle, S. [Future-proof: Preparing young Canadians for the future of work](#), p. 15. 2017: Brookfield Institute for Innovation + Entrepreneurship.

³⁷ Ibid., p. 17.

- Exploring digital literacy programs for youth across Canada, including in urban, rural, and remote communities;
- Identifying and addressing potential barriers to youth entrepreneurship and intrapreneurship;
- Providing timely labour market data, career planning, and mentorship support for youth entering the labour force;
- Enabling lifelong learning and rapid, job-specific upskilling and retraining (e.g. coding camps); and,
- Developing a data strategy to build a stronger evidence base for policy and program solutions.

An [October 2017 report from Deloitte](#) said we need to “reimagine Canada’s education system,” including:

- Reinvigorating the curricula to ensure young Canadians are acquiring the capabilities needed to succeed in a digital world;
- Re-examining how we organize our schools, from the physical setup to the school year itself;
- Placing a greater emphasis on interdisciplinary work, mental agility, critical thinking, teamwork, relationship management, and the capacity to learn itself — in other words, developing the integrated capabilities needed for the future instead of teaching individual subjects; and,
- Encouraging students of all ages to take risks, fail, and begin again, to equip them with the courage and resilience they’ll need to learn new capabilities, start a new career, or launch a new business.³⁸

The September 2017 report from the Institute for Competitiveness & Prosperity (ICP), [The Labour Market Shift](#), also matches what we heard at our forums throughout the country. The ICP called for the teaching of “broader skill sets to facilitate easier transitions through the labour market.”

Educational institutions should focus on helping students identify and train in a variety of skills, especially those identified as being in demand in the future (creativity, problem solving, critical thinking, digital literacy). Skills-focused education, especially transferable skills, will allow students to transition through the labour market more seamlessly. The old model of moving from education to a single, long-term career is becoming far less common.³⁹

The ICP emphasized the need for shorter, more flexible training programs to allow adult students to upgrade skills as needed throughout their lives. It also called for better co-ordination between post-secondary institutions and employers, with increased information sharing and alignment of objectives, to ensure

³⁸ Harrington S., Moir J., Allinson J., Hamer C., Beaudoin E., and Larocque N. [The Intelligence Revolution: Future-proofing Canada’s workforce](#): Deloitte.

³⁹ Institute for Competitiveness & Prosperity. [The Labour Market Shift: Training a highly skilled and resilient workforce in Ontario](#). 2017.

students are graduating with work-ready skills. The ICP noted that “work-integrated learning and co-operative education programs are one way to achieve this.”

PRIORITIZE ENTREPRENEURIAL SKILLS DEVELOPMENT

Instilling entrepreneurial skills within students is especially critical

Pooja Viswanathan, founder of Braze Mobility and a post-doctoral fellow at U of T, said:

“There definitely needs to be more training with academics, even for academics [who] don’t want to become an entrepreneur. Entrepreneurial skills are so important, in terms of understanding how the market works. Even if you are doing fundamental science, it’s so important to understand how that research might be applied in the real world. [...] I think it needs to come right from day one, in a research program. Understanding how whatever it is you’re creating, whether it’s technology or policy or processes [...] might be used in the real world is really important to know.”⁴⁰

PPF is currently working with Mitacs on a series of forums delving into the broad topic of campus entrepreneurship, with the aim of making specific recommendations. For now, we simply emphasize that entrepreneurial skills must be a greater priority.

Connected to this, the 2018 federal budget included initiatives “to increase the intellectual property literacy of Canadian entrepreneurs,” including “the development of intellectual property expertise and legal advice for Canada’s innovation community [...] to] improve access for Canadian entrepreneurs to intellectual property legal clinics at universities.”⁴¹ This is an important step.

FURTHER ENABLE COLLISION SPACES, INCUBATORS AND INNOVATION MARKETPLACES

Reducing the distance between academic researchers and industry is what will move us forward and make Canada globally competitive

Across the country, we often heard that universities and businesses should work together to create more “collision spaces”. Such spaces allow students, faculty and staff to regularly rub shoulders with entrepreneurs, leaders and scientists from startups, small and medium-sized enterprises (SMEs), and large industry. There are many examples throughout the country, including [Nova Scotia Sandboxes](#):

“Sandboxes are collaborative collision spaces hosted by universities and the Nova Scotia Community College (NSCC) that bring together students, mentors and external advisors to take

⁴⁰ Viswanathan, P. Remarks during a panel discussion at the Public Policy Forum’s *Transformational Gains* symposium in Ottawa, Feb. 1, 2018.

⁴¹ Honorable William Francis Morneau. [Budget Plan. Equality Growth: A Strong Middle Class](#), p. 116. 2018: Government of Canada.

business and social enterprise concepts from ideation to execution. They act as hubs and are designed to help leverage the human resource and research capacity in the province's universities and colleges to create changes in knowledge, skills and attitudes, and knowledge-based businesses or social enterprises, while also providing new educational opportunities for students.”⁴²

Canada needs to create more collision spaces. Tied to that, startups and SMEs should have greater access to the remarkable research infrastructure at universities. Universities are keen to facilitate this, but more work is clearly needed. [The Creative Destruction Lab](#) (CDL) is an example of how this can work. CDL “helps innovators transition from science projects to high-growth companies.” It is “a seed-stage program for massively scalable, science-based companies [that] employs an objectives-based mentoring process with the goal of maximizing equity and value creation.”⁴³ CDL’s program involves mentorship from select entrepreneurs and angel investors, opportunities to raise capital, advice on technology road maps, and business development support from top MBA students. Launched in 2012 at the Rotman School of Management at the University of Toronto, CDL has since expanded nationally with locations at the Sauder School of Business at the University of British Columbia, Haskayne School of Business at the University of Calgary, HEC Montréal, and the Rowe School of Business at Dalhousie University. CDL has also expanded to the U.S., with programming available at New York University in New York City. This highly successful model should be expanded further within Canada.

The Finance minister’s Advisory Council on Economic Growth (referred to as the “Barton Panel” throughout the rest of this report) recommended the creation of more “Innovation marketplaces”.⁴⁴ The advisory council stated that innovation marketplaces should:

- Focus on leading-edge innovation;
- Originate through market pull (address business needs identified by private-sector stakeholders);
- Include a risk-sharing objective (at minimum, the private sector should provide 50 per cent of capital);
- Demonstrate the potential for national and then global scale;
- Include multiple partners;
- Include success metrics; and,
- Play matchmaker for talent.

⁴² [Nova Scotia Sandboxes](#).

⁴³ Creative Destruction Lab. [Increase probability of success](#).

⁴⁴ Advisory Council on Economic Growth. [Unlocking Innovation to Drive Scale and Growth](#). Feb. 6, 2017.

The Barton Panel pointed to a specific example of an innovation marketplace that has already formed here, [Canada's Oil Sands Innovation Alliance](#).⁴⁵ The alliance was launched in 2012, and member companies have already shared 936 distinct technologies and innovations that cost almost \$1.33 billion to develop.⁴⁶

The Barton Panel acknowledges that the federal government's [Innovation Superclusters Initiative](#) "has the potential to catalyse innovation through a similar approach."⁴⁷ McGill principal Suzanne Fortier, who served on the advisory council, said:

"We talked about innovation marketplaces. I very much like that particular vision. I hope superclusters will be that, a much more open environment, like a market. If I've got something to sell, I can go there, it's open to everybody who has something interesting to bring to the market. And if I'm a customer, I can go there. It's not a club. It's completely open. [...] I think often we go through these processes that are so competition-oriented that we sometimes diminish the openness of what we need to do in terms of creating the environment, so that would be my vision of the superclusters evolving to be just that. We've had the initiatives in the past, where if you win the competition, you're in the club, and those who were not there at the beginning are not in the club. I think we have to move out of that kind of mode and say: 'This is a great initiative, it's an area in which Canada should invest, there's a lot of potential.' But let's make it completely open, so that anybody at anytime can come in if they have a contribution to make, either as a customer, as a seller, as a connector, whatever they have to bring."⁴⁸

We heard a lot of support for the superclusters approach, including a deep recognition that the competition process brought together individuals and organizations that had not previously worked together. University of British Columbia president Santa Ono said:

"The recent competition for research superclusters is a clear example of how fruitful and useful it is to catalyse that kind of conversation between industry, academia and organizations that support fundamental research and the translation of research. I can say that, in Vancouver, that competition brought together individuals [who] rarely got together and that has persisted and, regardless of the outcome of that competition, will have a lasting, positive effect on what we do in Vancouver and British Columbia. So that is something that we, as Canadians, need to hardwire into how we go about shaping the innovation ecosystem."⁴⁹

⁴⁵ Advisory Council on Economic Growth. [Unlocking Innovation to Drive Scale and Growth](#), p. 10. Feb. 6, 2017.

⁴⁶ [Canada's Oil Sands Innovation Alliance](#).

⁴⁷ Advisory Council on Economic Growth. [Ideas Into Action: A Review of Progress Made on the Recommendations of the Advisory Council on Economic Growth](#), p. 4. Dec. 1, 2017.

⁴⁸ Fortier, S. Remarks during a panel discussion at the Public Policy Forum's *Transformational Gains* symposium in Ottawa, Feb. 1, 2018.

⁴⁹ Ono, S. Remarks during a panel discussion at the Public Policy Forum's *Transformational Gains* symposium in Ottawa, Feb. 1, 2018.

However, Canada cannot declare “mission accomplished”. More work is needed, both to ensure that the announced superclusters are open, dynamic environments, and to advance innovation marketplaces in other ways as well. This has the potential to be a key driver of increased collaboration and a key builder of more connective tissue between industry, universities and research institutes.

CONCLUSION

To strengthen our innovative capacity, global competitiveness and economic and social fabric, Canada must focus on research, talent and innovation.

Not only do we need well-educated, highly skilled people to tackle our toughest challenges, a strong talent pool is critical to attracting investment, growing businesses and driving job creation. Canada has many of the right components in place, even if they are not yet always at the right scale, but we are often missing the linkages between those components.

Our national engagement project, backed up by other studies and reports, points to several important ways of advancing a talent and connective-tissue agenda in Canada.

It starts with making Canadian research globally competitive, by continuing to strengthen the foundations of research, increasing support for the institutional costs of research, and reinvigorating support for graduate students.

It requires better co-ordination of skills development, including revamped curricula, more work-integrated learning opportunities, prioritization of entrepreneurial skills development, and the advancement of innovative skills-development programs.

Canada is well positioned to capture the transformational gains that result from foundational investments in research and a highly skilled workforce. Canada must act quickly. This can be Canada’s moment, but moments do not last long.

