Introduction

Thank you very much for coming today. I am delighted to be a guest of the Economic Club of Canada.

I want to speak to you today about the future.

About the challenge of maintaining, in that future, our standard of living and our quality of life.

And about the crucial role that Canadian universities are playing in the national effort to meet that challenge.

But first, allow me a brief reference to my past.

Over a decade ago, I served as Canada’s Minister of Industry, a portfolio that affords the occupant a panoramic view of our economic performance, including our challenges.

I quickly learned that one of the most urgent of those challenges was our standard of living, which had then been in decline relative to the United States for two decades.

Simply stated, Canadian incomes were considerably lower than in comparable households in the United States. The explanation was low productivity undermining our competitiveness.

A major factor in all of this was under-investment by Canadian business in research to discover newer and better products and processes.

Research fuels innovation. Innovation – harnessing the market potential of new ideas - drives productivity. Productivity is key to competitiveness which, in turn, determines our standard of living and ultimately our quality of life.

At that time, in the early 2000’s, we were ranked a lowly 14th in the OECD for the percentage of GDP spent on research and development.

And despite significant government investments in public R&D, we had not, by the time I left in 2003, closed the innovation and productivity gap between Canada and our competitors.

Today, investing in research to fuel innovation is more essential than ever.
Because we live in what New York Times columnist Thomas Friedman describes as:

... A hyper-connected world where, for innovation-driven, global corporations, the mantra is now: imagined here, designed there, manufactured elsewhere, sold everywhere.

Well, how are we doing, more than a decade after my time in Industry?

- Canada invested less overall in R&D in 2012 than it did in 2004.
- Russia, India, Taiwan and Brazil have leapfrogged ahead of us.
- Canadian business spending on R&D is now less than 1.0% of GDP – near the bottom in the OECD; and
- The Canada–U.S. per capita income gap was three times in 2012 what it was in 1980.

In short, the challenge now is the same as it was when I was in office. How do we make Canada more innovative, more productive, and more competitive? How can we invent that future?

Well, I’ve spent the last seven years as president of a university. The view from where I now sit is less panoramic, but it still looks out over the innovation landscape.

What I see in universities makes me more optimistic than I was 10 years ago about our prospects for progress. And what’s more, I don’t have to attend Question Period every afternoon!

My message here today is that if our universities are given the tools they need, and if they build stronger relationships and new partnerships with industry, they can be the centrepiece of a national strategy to overcome the performance gaps holding us back. Universities can help make Canada the most innovative country in the world.

Canadian universities contribute to our innovation efforts in four principal ways that we must build on going forward in order to improve the lives of all Canadians:

First, we graduate the highly qualified people that are essential to a more innovative Canada;

- Second, our research is crucial to discovery and innovation across all sectors of the economy;
- Third, in partnership with business and industry, we are increasingly commercializing that research to ensure that innovations get beyond the campus to the marketplace; and
- Fourth, we foster in the next generation an entrepreneurial spirit that is conducive to an innovative economy.

1. Highly qualified people

Let me start with education.

Because we’re not going to get where we want to go without highly qualified people to lead in every segment of the economy.

And here, there is both good and troubling news.

Canada leads the world in the percentage of our population with post-secondary education, which includes both colleges and universities.
Among OECD and G20 countries we rank first in the proportion of 25-64 year-olds – 53 % – in this category. This gives us a big advantage.

This progress has been achieved through the focused efforts of provincial governments, like ours here in Ontario.

Ten years ago, then Premier Dalton McGuinty established the goal of having 70% of high school students go on to earn post-secondary credentials, an ambitious target that we are close to achieving.

Under Premier Wynne’s leadership, the government’s commitment to post-secondary education remains strong, for which we are grateful.

But we have fallen from 5th to 17th when it comes to the number of 25 to 34 year-olds who have completed a university degree.

Other countries are investing further and faster in university enrolment. We are going to need a high number of both college and university grads. On the university front, we are letting our competitive advantage slip.

And let there be no doubt about the quality of the education on offer in our universities.

The newest teaching technologies are making the basics accessible on line so that classroom time is spent on active learning and creative problem-solving rather than taking notes.

And students engage increasingly in experiential learning, applying theory to reality with enriching results.

We offer:

- co-op placements,
- community service learning,
- mentoring and internships,
- volunteer opportunities
- study abroad programs, and
- Undergraduate participation in sophisticated research.

Our graduates leave campus with the intellectual skills needed to compete and win.

At the University of Ottawa, we recently evaluated the effectiveness of our teaching by measuring learning outcomes among our graduates. The findings, validated by a third party, showed that over the course of their studies, our students significantly improve their critical thinking and analytical reasoning skills. In fact, we rank among the top 4% in North America on this.

And by the way, don’t listen to those who claim that four years on campus is a waste of time and tuition. Canadian university degrees are leading to remunerative careers.

Professor Ross Finnie of the University of Ottawa partnered with Statistics Canada in an unprecedented study to link our graduates to their tax records. He followed the earnings of bachelor-level graduates on a year-by-year basis after graduation, tracking graduates from 1998 through to 2011. Results were analyzed by area of study as well as year of graduation.
The study found surprisingly strong outcomes across the board, including for graduates from arts and social sciences.

The findings are especially important at a time when studying the arts and humanities is falling out of favour. Many students no longer see an undergraduate degree in history or political science as the foundation for a viable career path. This new research suggests otherwise.

For example, social sciences graduates tended to start with average earnings of $40,000 immediately after graduation, but these grew substantially, almost doubling to an average of just under $80,000 during the period under study. And remember—these data were taken directly from individual tax returns, not simply averages.

And let’s not forget that graduates from the arts and the humanities are crucial to our innovation future.

Canada also needs innovation in public policy, like social programs, governance and foreign relations. With their critical thinking, communications skills, understanding of human behavior, graduates in the humanities and the arts will help make Canada more innovative in the global marketplace.

Canadian universities also make an important contribution to our economic future by attracting international talent: faculty and students who will help us invent our future, or return to their own countries as friends and ambassadors for our interests there.

Recent investments from the government of Canada have helped us draw on this international supply of talent, including new scholarships for graduate and post-doctoral students.

2. Research

While the first part of our basic university mission is learning, the second is discovery. And here, Canadian universities have a remarkable record of achievement.

In Canada, the higher-education proportion of public R&D is twice the average in OECD countries. Canadian universities and teaching hospitals spend $12 billion a year on research, in every field of endeavour.

Every university makes an important contribution. Here in Toronto, we think of course about U of T. But York University is another leader: for example, for its research on refugee issues.

And Ryerson’s Digital Media Zone is one of Canada’s largest business incubators.

OCAD University does research that is at the heart of the new economy, in art, design and media.

Some of Canada’s most research intensive universities have formed a strategic alliance called the U15 Group.

The U15 is home to almost half the university students in Canada, and almost three-quarters of full-time PhD candidates.

The U15 Group advocates with government, partners with industry and collaborates internationally, in order to strengthen our country’s capacity for innovation.

At the University of Ottawa, we rank among the top ten research-intensive universities in Canada, and have been internationally recognized in fields like neuroscience, cardiology, stem cells and photonics, but also philosophy, linguistics and public policy. We are ranked second in Canada, after only the University of Toronto, for research intensity in health and in science.
On pourrait qualifier notre campus de « société distincte » si on le compare à d’autres grands campus au Canada, car nous sommes aussi la plus grande université bilingue français-anglais au monde. Tout ce que nous faisons, nous le faisons dans les deux langues. Notre population compte 43 000 étudiants : de ce nombre, 14 000 sont inscrits dans des programmes offerts en français, et 2000 autres étudiants sont inscrits au régime d’immersion en français.

Our mix of languages, cultures and perspectives creates an unconventional environment conducive to game-changing ideas. We are a place where physicists work with neuroscientists to understand stroke, where business analysts work with doctors to improve patient care in emergency rooms. As we like to say, “We defy the conventional”.

Now all of this Canadian university research represents a significant public investment. Is it worth it?

Some criticize university research as too often without practical application. Where’s the return on investment, they ask. What practical difference are you making in the lives of people?

Well, you can decide for yourself: Across the campus, just as at other U15 universities, our scientists are working on:

- using viruses to fight cancer
- new ways to store energy,
- techniques for growing artificial skin for burn victims,
- improving dialysis for kidney patients and,
- in our Brain and Mind Institute, harnessing the brain’s remarkable ability to heal itself.

So let there be no doubt: public investments in the research enterprise at Canadian universities bring important returns, a fact recognized by the Government of Canada when it announced the creation last spring of the Canada First Research Excellence Fund, investing $1.5 billion over the next decade to fund research projects chosen following a national competition and focused in strategic areas.

3. Commercialization

Let’s turn to the third way Canadian universities are helping us meet the innovation challenge. We help bring new discoveries to market, and turn new ideas into economic activity.

But is the pace of commercialization sufficiently brisk? Again, where’s the return on the public investment?

To that I say two things.

Consider, first, a comparison of Canadian university licensing results from 2003 and 2013. Although these figures reveal only a narrow aspect of our commercialization performance, they provide an indication of progress on that front:

- Over the ten year period to 2013, the number of inventions disclosed per year in Canada increased by 50%.
- The number of new patents filed annually more than doubled;
- The number of university spin-offs increased by 20%; and
- Licensing income increased by 40%.
So we are going in the right direction.

My second response to those looking for return on investment is that Canadian universities are among the world’s leaders in the number of partnerships with industry, and the “out-sourcing” by the private sector of its R&D function.

According to the 2012 State of the Nation Report from STIC, Canada ranks seventh among 40 comparator economies with respect to business funding of R&D on campus, with a ratio twice that of the U.S.

What does this mean?

While the private sector lags seriously in its own R&D investment, the money they do invest is in large part put to use on our campuses.

By investing in campus research infrastructure and capacity, you are ensuring that when the private sector turns to us for help, we are able to respond.

Equally important is building stronger relationships and finding new ways to work together. This was one of the key lessons from a conference the Association of Universities and Colleges of Canada organized last year.

They heard from experts from Israel and Germany - two of the most innovative countries in the world - about how their success is tied to the depth of the relationship between their universities and their industrial sector.

We are working on deepening those relationships here in Canada.

The University of Ottawa has submitted a major proposal for funding from that new Canada First Research Excellence Fund to which I referred. We joined in making the proposal with the University of Toronto, Institut national de la recherche scientifique, University of Sherbrooke and Queen’s University, as well as with 45 industrial partners and more than 20 national and international academic institutions and government organizations.

The proposal involves photonics – harnessing the power of light – to enable new manufacturing processes with extraordinary quality that will allow mass customisation, rapid manufacturing and zero-fault production.

It also includes elements that will lead to stronger relationships with our industrial partners, including seconding staff from companies to work with us on campus and hiring new university researchers with a passion for applying the latest developments in ways that will help companies. We want to improve the flow of talent between companies and universities.

4. Fostering the entrepreneurial spirit

Now allow me to say a few words about the way universities are creating a new generation of enterprising young Canadians.

Earlier I talked to you about how much teaching and learning have changed. One reason for this is because today’s students have changed. In meeting and talking with students I see a new level of ambition for themselves and for Canada. They don’t simply want to get a degree and get a job. They want to develop new products and create their own jobs. And at Canadian universities they are doing just that.

_E-Hub_
The University of Ottawa’s Entrepreneurship Hub, or E-Hub, helps students bring their ideas to life. It is available across the campus, to students in every faculty, from Medicine to Law, from Arts to Education.

The E-Hub defines entrepreneurship as much more than learning what it takes to start a business or social enterprise. It looks to help students become problem solvers and to see change and uncertainty as a source of opportunity.

**Start-Up Garage**

Our Start-up Garage program, about to enter its sixth season, provides a boot-strap summer cohort program for student entrepreneurs that has launched over 40 student-led companies.

**Makerspace**

A connected initiative is the University of Ottawa Makerspace, which provides students with training and access to equipment like 3D printers and scanners, laser cutters and other state-of-the-art tools. It’s a casual but structured workspace, where people can meet and collaborate on projects in computing, machining, robotics, technology, or digital and electronic art.

Around the world, the maker movement is empowering individuals and teams to develop innovative solutions to real-world problems, using their imagination and their own two hands. One of the most exciting advantages of the movement is its capacity to respond to humanitarian needs with cost-effective solutions, including producing inexpensive umbilical cord clips for hospitals in Haiti.

Let me give an example of a project that is coming to life at our Makerspace. One of our students has been working with a heart surgeon at the Children’s Hospital of Eastern Ontario to transform a two-dimensional scan of a tiny heart into a life-size model using a 3D printer. This exact replica of a tiny human heart will allow surgeons to practice the most delicate surgery on a life-like model, so as to better prepare for challenging operations.

In the U.S, makerspaces are beginning to attract the involvement and support of major corporations. Companies see them as new way to boost innovation. They encourage their employees to use them or submit ideas. I’d love to see the same thing happen here.

**Conclusion**

So where do we go from here? No one actor can meet our nation’s innovation challenge alone. But I insist that Canadian universities are playing a vital part.

With sustained public support and ever deeper relationships with the private sector, universities can do more of what we already do so well:

- produce highly qualified people;
- attract international talent;
- conduct ground breaking research;
- partner with industry; and
- instill an entrepreneurial spirit in those who are leaving to start their careers.

And what is the message to other actors?

To the business sector, I say look to us for solutions, but also look for new ways to exchange, to partner and to strengthen Canadian innovation.
Let's make the walls between us more porous.

And help us help you!

Hire a co-op student. Become a mentor. Fund a student start-up.

To alumni and friends of Canadian universities: philanthropy will also play a major role in supporting our mission. Your gifts have an impact on the future of our country.

Next month the University of Ottawa will launch the most ambitious fundraising campaign in its history: Defy the Conventional: the Campaign for the University of Ottawa. We will be looking to alumni, to businesses and industry to contribute as we secure the future of this major Canadian asset.

To government, both federal and provincial, never doubt that your investments in post-secondary education are wise and worthy. I encourage the provincial government to continue its investments to widen access and improve quality, upon the federal government for sustained investments in research, and I encourage both to spend on improving our university infrastructure.

My purpose here today has been to underscore the importance of innovation as we seek to achieve the full potential of our people. I hope that I have persuaded you of the importance of that cause, and that Canadian universities are key players in the effort.

I hope too that this challenge will merit public discussion. This year’s election campaign will of course focus the attention of Canadians on difficult issues like security and terrorism and the painful fallout of our long recovery from a global recession. But there must surely also be scope in that campaign for setting forth a positive vision for our future.

I want to emphasize that improving our nation’s innovation record is not about racking up impressive economic numbers for their own sake.

This is about the kind of future we are building for ourselves and our children. It is about increasing our standard of living so that we can improve the quality of our lives.

Let me leave you with a story that illustrates the human value of innovation. The story of a six-year-old boy named Sebastian Chavarria.

Sebastian was born with a left-hand that will never grow to full size. He was finding it difficult to ride his bike – and do other activities.

The solution was a prosthetic hand. But they are expensive – as much as $25,000 – and a growing child can need one every year. His doctors thought he should wait until he was older. His mother turned to us.

Through Makerspace, we challenged our students to find a solution. The students used a 3D printer to make a hand at a cost of about $20.

He’s wearing it now, riding his bike, and has become the envy of his classmates because of his “Iron Man” hand.

That happy ending came about because university students with creative minds used technology to help find a revolutionary new and inexpensive idea that changed one kid’s life.

Let’s take that enterprising spirit, apply it across the spectrum of research on our campuses, and—together—let’s invent a future that will secure Canada’s place as one of the most innovative countries in the world.

Thank you.