



GLOBAL HIGHER EDUCATION FROM A CANADIAN LENS

Inaugural J.R.D. Tata Memorial Lecture
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Thank you, Dr. Mabare, for that kind introduction.

Vice-Chancellor Khole, Consul General of Canada in Mumbai, Mr. Gary Luton, distinguished guests, academic colleagues and students, it is a great honour to be here today to deliver the inaugural J.R.D. Tata Memorial Lecture at the University of Mumbai.

Before I begin, let me congratulate the University of Mumbai on the celebration of its 150th anniversary. I know what such a milestone means for an institution. In 2008, the University of Alberta will celebrate its centenary.

Both of our universities may be young institutions but we can take great pride in our remarkable growth and in our service to our students, nations, and the world.

I am very pleased to address you today, and to provide a Canadian perspective on the topic of higher education and the enormous role that it plays in developing technological and social innovation and in promoting global citizenship.

Shortly after I was honoured with the invitation to give the first Tata Memorial Lecture, I decided on this topic, because the Tata conglomerate and family have contributed much to the technological, economic, and social advancement of India, while also promoting the social welfare of their society.

J.R.D. Tata grew up in a family with a multicultural and international perspective. He proved to be a talented and innovative leader—an entrepreneurial risk-taker who built a multinational corporation that advanced India's social and industrial development, helping to pave the way to India's independence and its emergence onto the global stage.

Behind the business acumen, though, laid a great sense of social responsibility as well. Through visionary philanthropic work, J.R.D. Tata passionately served the needs of the country and its people in a variety of ways, ranging from improving working conditions to building institutions of higher learning to advocating for family planning.

In short, J.R.D. Tata is a model for the kind of technical and social innovator and global citizen I would like to speak about today.

I have experienced life in a diverse range of cultures although my journey has taken the opposite geographical course. I left my home in Sri Lanka as a young woman, newly graduated with my engineering degree from the University of Ceylon.

I left to pursue a Masters degree at the University of California, Davis on a Hayes Fulbright Scholarship. My stay in the U.S.A. led to an academic career in Canada, where I have lived for the past thirty years. In recent years, I served as Vice-President (Research) at the University of British Columbia for five years before becoming President of the University of Alberta in 2005.

When I look back over my life, I sometimes marvel at the contrast between the two parts of the world I have spent most of my life. Indeed, at first glance, Canada and India could not be more different. Canada is a very large but sparsely populated northern nation—in contrast to India which is much more densely populated.

I am also often struck by what a young nation Canada is in comparison to a country such as India. Edmonton—where the University of Alberta is located—is such a new city in comparison to Mumbai or Bangalore.

A city of one million people located in north central part of the province of Alberta, close to the majestic Rocky Mountains, Edmonton has only really come into its own in the second half of the 20th century. And yet, in spite of these differences, Canada and India share important similarities that I believe give us unique perspectives on higher education.

Like the citizens of India, Canadians live in a richly diverse society—ours built by waves of immigration.

Over the course of Canada's history, people from the British Isles, France and the U.S.A. arrived in Canada, then from central and northern Europe, and then from eastern, Slavic nations. In the 20th century, immigrants arrived from South and East Asia, the Middle East, and Africa. Today, Canada welcomes more immigrants from China and India than anywhere else. We have close to a million Canadians of Indian descent who have contributed to Canada's prosperity and our knowledge of India.

Canada and India are members of the Commonwealth, and are part of a big, international family. Being a part of this family involves certain responsibilities that affect our national outlook. Both of us find it prudent to keep an eye on the international arena, where we may at any moment be called upon to help or defend the family.

Like Canada, India has a vibrant economy, and yours is growing at unprecedented rate. The sharp rise in economic productivity over the last decade has transformed the lives of millions of Indians and has had a great impact upon the world's economic landscape.

If growth continues as predicted, India's middle class will grow tenfold by 2025, and with it, the demand for consumer goods and services will increase. This will drive the need for greater technical innovation and more highly educated people.

Canada, and more particularly, the province of Alberta, are also in the midst an economic boom, fuelled by enormous growth in the energy sector. As one of the world's leading energy producers, with energy resources second only to Saudi Arabia, investment is flooding into Alberta. A quarter of the province's gross national product is generated by the energy industry, employing nearly 20% of Albertans.

In spite of our current prosperity, Albertans are aware of our need to diversify our economy and to move away from our dependency upon the resource sector and into much higher participation in the knowledge sector. In other words, like you, we must invest in talent. This is imperative because as we advance into the 21st century, we are facing a new world.

With incredible advances in information and communication technologies, knowledge, ideas, and expertise travel across the globe in a split-second via email, internet, and open-source software. People are highly mobile, moving between countries with ease.

Companies and organizations are increasingly multi-national, competing through global supply chains and marketing and managing their operations through virtual networks. As Nobel Laureate in economics Robert Solow has shown us, with technology as the key driver of productivity and wealth-generation, brain power—rather than oil, lumber or minerals—is every country's pre-eminent natural resource.

No wonder, then, that leaders of post-secondary institutions around the world are talking about the globalization of education. In the past year, I've spoken with audiences in the US, Japan, and elsewhere about how we—in the field of higher education—might respond to the changing global landscape.

We are all asking this question: how we can effectively prepare our students for globalization? To attempt to answer this question, we first need to consider what kind of competitive world they will enter.

In this new world order, business is not the only sector to go global. Our challenges are global – climate change, energy security, health and human security.....Research and Development has also become increasingly global.

Investments in R.&D. continue to be dominated by just five countries—the U.S.A., Japan, Germany, France and the U.K.—but the research itself is global, and it is occurring all over the world. For example, recent statistics show that U.S.A. firms spent \$21 billion in R.&D. in foreign countries, including Canada and India, while foreign-owned firms spent \$27.5 billion in R.&D. in the U.S.A.

Illustrating another trend, the vast majority of U.S.A. R.&D. spending by industry—77 percent—was focused on technology development, with a much smaller focus on applied or basic research. The shift in private sector R.&D. towards technology development, away from basic research, as well as the growth of foreign R.&D. investment, marks a profound change!

What do these changes to the global research sector mean for institutions of higher learning?

First, if global companies are no longer expending R.&D. funding on in-house basic and applied research, then universities must step into this gap and create new research partnerships with the private sector to perform this foundational work.

Universities, in contrast to corporations and industry, can conduct risky, curiosity driven research that can lead to new discoveries and genuine invention; such as the discovery of insulin.

On the other hand, corporations, while increasingly risk-adverse, can excel in innovation— that is, they can lead in taking new discoveries and inventions and transforming them into products, services, and processes for the marketplace. Think Google.

How can universities and the private sector productively put our research and innovation capacities together and play to one another's strengths? In his landmark book, *Pasteur's Quadrant*, the late Donald Stokes, from Princeton University, creates a compelling model enabling interaction between basic science and technical innovation.

First, he proposes, there is basic research, usually discovery oriented, with no thought of practical application; for example Dr. Werner Israel's work on black holes. Next there is basic research that is use-inspired from which a long-term societal benefit is anticipated such as the discovery of insulin and the treatment of Type 1 Diabetes through the Edmonton Protocol. Finally, there is applied research and technology development directly aimed at problem solving; an example here is the successful computer and video games company BioWare that was created by three medical students from the University of Alberta.

So in my opinion, universities in India and Canada that build new partnerships to conduct basic, use-inspired and applied research with major global companies, who can take the resulting innovations to market, will ensure India's and Canada's continued growth.

Canadian universities are seeking to establish research partnerships with universities in India. This new internationalized research landscape, itself a product of the globalization of the marketplace, forms the new world that our students will face.

How we can effectively prepare our students for this new reality? The first and most critical role of universities has always been to nurture human potential—to educate and prepare students to make productive contributions to their professions and communities.

What will these talented people be like? What kind of education will they need? A nation's ability to develop a globally competitive workforce, it seems to me, must begin not at university but in the elementary, junior and senior high school system.

In Alberta, we have dedicated resources to developing novel methods to raise the quality of our public schools, in both traditional and multicultural curricula.

Through the development of such specialized programs, on the one hand, and the implementation of standardized testing, on the other, Alberta now boasts the strongest educational system in Canada.

Alberta's fifteen-year old students, and in fact Canada's students, are consistently ranked among the world's highest achievers in the OECD's International Student Assessment tests of mathematics, reading, science, and problem-solving.

An outstanding primary and secondary school system is an important starting place. But the commitment must not end there. To participate in the international knowledge economy, students require post-secondary education—education that cultivates critical and flexible thinking.

Former President of Harvard, Derek Bok, in his recent book *Our Underachieving Colleges*, argues that universities would better prepare students for the realities of the 21st century if they focused on a key set of learning outcomes. At the end of their undergraduate degree, Bok contends, students should be able to communicate clearly and effectively; think critically; and reason through moral and ethical questions. They should be prepared to contribute to civil society and to their chosen professions, be able to live with diversity, be ready to work with global partners, and have a breadth of interests. I would add to this list that undergraduate education should encourage creative thinking.

How to cultivate the habits of a creative and critical thinker, one that not only learns new ideas but also integrates them into innovative approaches to problems? Interdisciplinary, discovery learning is a possible start.

Earlier this month, for example, a team of University of Alberta students from engineering, pharmacology, biology, cell biology, botany and biochemistry, won first prize in a competition held at MIT. Given the assignment of creating a green fuel, they integrated their multiple disciplinary perspectives and came up with a process that turns bacteria similar to *E. coli* into butanol, a biofuel that could eventually replace gasoline.

Increasing opportunities for our students to study or work abroad during their degrees is also critical. From my own experience, I know that the challenge of stepping from one culture to another is much more difficult in actuality than in imagination—but also much more likely to produce a real change in a person's critical thinking and problem-solving skills.

Being an international student or working with one on your own campus sharpens your perspective of your own culture as well as that of others. The cross fertilization of ideas and cultural perspectives can deeply impact one's multicultural awareness and experience.

Making it possible for every student to have an international experience can be expensive for institutions—in many cases, prohibitively so. In the face of this reality, we must create more opportunities for a globalized education on our own campuses.

In fact the University of Alberta is expanding access to international students with generous scholarships. International students coming to Alberta can work on and off campus to secure additional financial support for their education. The Alberta Government has introduced a policy to enable international students to work for two years after graduation.

As part of a very diverse community in Edmonton, the University of Alberta is also known for its breadth and diversity of programs. We have a French campus where students can receive degrees in French.

We are also home to a number of research centres, relating to many parts of the world, ranging from Europe through to Africa, the Middle East, and China.

Recently, we have experienced exciting growth in South Asian studies—again as a result of our close ties to Edmonton's community.

Due to major philanthropic gifts from individuals in the city, we have recently established two new endowed Chairs—one in Classical Indian Polity and Society, the only one of its kind in Canada, and the other in Islamic Studies.

Combined with expertise we already have in Indian economics and literature, our students now have access to a comprehensive view of an area of the world of rapidly growing geopolitical importance. Our students need the skills, knowledge, and ambition to be tomorrow's innovators, inventors, and discoverers—especially in science and technology.

Every nation's economic growth and prosperity in the future will increasingly be linked to recent, ground-breaking scientific discoveries in information and communications technology, molecular biology and nanotechnology.

These technologies promise to unleash innovation on a scale we have not seen in decades. But these technologies are highly complex and sophisticated. To reap the benefits they hold, increasing the number of graduate students will be critical.

With their youthful confidence and unfettered outlook, today's graduate students and post-doctoral fellows are essential contributors to the world's research economy.

Graduate students, many of whom bring a worldview rich in technology-use, are producing many of the technology-driven applications of knowledge and social innovations that are igniting the global imagination. Think Face-book; Think Google. As a result, the University of Alberta is providing scholarships to national and international graduate students to expand the global talent pool.

The discoveries, inventions, and innovations needed by the world will only emerge from a highly educated workforce whose talents and potential have been nurtured from public school through to graduate studies.

By cultivating a more international educational experience throughout, students will be better prepared to participate in global corporations and research networks—and will have the capacity to drive forward national and international economies to the benefit of a growing number of people around the world.

But will this be sufficient to meet the needs of the global community? As we advance into the 21st century, I am reminded of a warning that Lester Pearson, former Canadian Prime Minister and winner of the 1957 Nobel Peace Prize, issued over sixty years ago:

"We are now emerging into an age when different civilizations will have to learn to live side by side in peaceful interchange, learning from each other, studying each other's history and ideals, art and culture, mutually enriching each other's lives. The only alternative in this overcrowded little world is misunderstanding, tension, clash, and – catastrophe."

Pearson spoke these words at the dawn of the nuclear age ... at the cusp of what we now know as the Cold War. Six decades have passed, and so much has changed ... and yet now, today, we find ourselves living in a world that too closely resembles Pearson's dark prediction.

In spite of the great technological advances of the late 20th and early 21st century, the international community has lacked the ingenuity to match these technological advances with the great social, political, and cultural advances the world also needs.

To be more precise, we have lacked *social* ingenuity and we have lacked a sense of global citizenship—of the kind I see exemplified in J.R.D. Tata. The global community today faces numerous problems. Global warming and climate change, the AIDS epidemic, grave disparities between rich and poor, and terrorism, to name only a few. Technology alone cannot solve these problems, although it will provide us with vital tools.

In addition to these tools, we also need to develop—out of a sense of our shared citizenship on this globe—the social innovations that can lead to and allow for the peaceful interchange between cultures that is absolutely necessary to achieve prosperity for all.

Two of my favourite models of this kind of global citizenship and social innovation are "Doctors Without Borders/Médecins Sans Frontières" and "Engineers Without Borders."

As you know, "Doctors Without Borders" delivers emergency aid and health care to people affected by armed conflict, epidemics, and natural or man-made disasters in more than 70 countries.

Similarly "Engineers Without Borders," formed in Canada in 2000 by two young engineering graduates, promotes the idea that technology can drive extraordinary change. They are improving rural communities around the world by working on projects in areas such as water, sanitation, food production and affordable energy.

These organizations, initiated and inspired by individuals with a global sense of citizenship, are models of both technical and social innovation. Their aim is to create the conditions for prosperity within the communities they help.

How do we arrive at the kind of social ingenuity inherent in these two volunteer organizations? Again there are no easy answers, but at the heart of both organizations lies higher education. Universities educate the doctors and engineers who make up these organizations—and our potential impact does not stop there.

Others working to improve the human condition in the global commons are also drawn from our graduates in many other fields as well: fields such as education, nursing, law, finance, agriculture, and so on.

Our most talented students have the potential to discover the scientific, medical, technological, or social innovations that will lead to key solutions to global problems. People like last year's winner of the Nobel Peace Prize, economist Dr. Muhammad Yunus who's Grameen Bank has broken the chains of poverty for thousands of people through the social innovation known as micro-credit.

As we enter the 21st century, a new global citizenship coupled with technical expertise will be needed to deal with the challenges we face together—whether they are social, political, technical, economic, or environmental.

Universities across the world have a critical role to play as we face them:

- by conducting cutting-edge research, leading to the scientific breakthroughs and technical innovations needed to advance human knowledge, solve global problems, and ensure economic prosperity;
- by cultivating the human capital and talent needed in the global marketplace as well as in the research laboratory;
- and, by fostering social ingenuity and global citizenship.

I began today by suggesting that India and Canada, as members of the Commonwealth, have a particular perspective to bring to the internationalization of higher education. Having this shared history, we both have for some time developed a habit of international engagement and responsibility.

We have, I would suggest, an excellent foundation upon which to build a vision of the new kind of global citizenship needed to face the challenges we share with the rest of the world. Universities of the 21st century are only just beginning to understand that a new vision is needed by our students.

They are the leaders of tomorrow. They will be the ones to develop the technical and social innovations that will change their local communities—as well as the global community—for the better. Let us respond with educational programs that will help to prepare them for that future.

If innovation is born out of interdisciplinary, multicultural exchange and collaboration—as I've been suggesting today—then let our academic communities begin such a process of collaboration.

I'm not only speaking here of exchange at the level of research projects—which is something we have long done—or at the level of student exchanges—though more of these would be beneficial—but let us also collaborate as teachers and designers of higher education.

Together we will – indeed, together we MUST – cultivate in our students a new kind of global citizenship. Thank you.