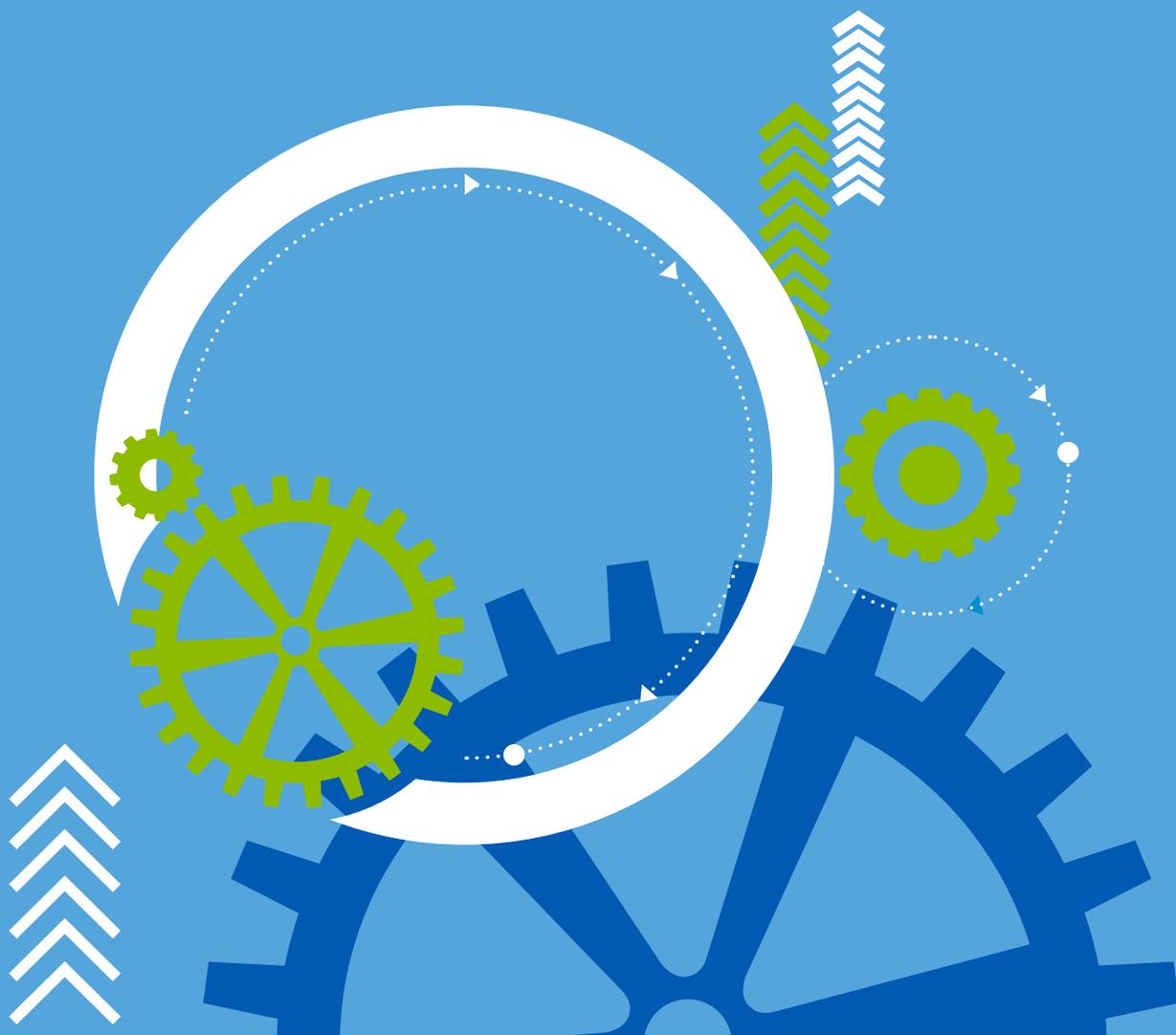


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# Toward Stronger Innovation Systems:

Lessons from AUCC's Innovation Policy Dialogue



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Successful innovation policies and practices are tied to nations' distinctive histories, societies and attitudes — but sharing them can galvanize fresh thinking and new approaches across national borders. This was the foremost lesson from the conference “*Optimizing Canada’s innovation system: Perspectives from abroad*” that the Association of Universities and Colleges of Canada hosted in Ottawa in October 2014.

# Optimizing Canada's innovation system: Perspectives from abroad

The conference, the second innovation policy dialogue in an AUCC series, brought together distinguished higher education leaders from Canada, Germany and Israel to explore national policies in science, technology and innovation, with the aim of drawing lessons to strengthen Canada's national innovation system.

Germany and Israel are two of the world's most innovative economies, sharing excellence in research and innovation,

strong practices of academic-industry collaboration and prominent high-tech sectors. Germany is one of the world's largest exporters of high-tech goods. Israel has a renowned record in innovative technologies, supported by an outstandingly entrepreneurial society willing to take risks in pursuit of success. For its part, Canada stands out for the high proportion of national R&D conducted by universities and for recent decades of strong federal and provincial investments in research talent and infrastructure.

## A snapshot of each country's innovation system



### Canada

**“Canada is getting better at fostering the relationships and partnerships that advance innovative collaboration”**

**Gilles Patry, president, Canada Foundation for Innovation.**

Number 1 for share of GDP spent on postsecondary education (college and university) among OECD countries. (Source: OECD)

Decreasing rate of business spending on R&D in relation to GDP (now below the OECD average).

Strong government research funding support and investments in university research infrastructure.



### Israel

**“In Israel many start-ups are funded in the recognition that few will succeed”**

**Ruth Arnon, president, Israel Academy of Sciences and Humanities.**

High R&D expenditure as a percentage of GDP. (Source: OECD)

Number 1 for venture capital investment as a percentage of GDP. (Source: OECD)

Strong public and governmental commitment to scientific excellence.

Strong entrepreneurial spirit and acceptance of risk.



### Germany

**“The country understands that funding research is fundamental for German prosperity”**

**Enno Aufderheide, secretary general, Alexander von Humboldt Foundation.**

Steady increase in public and industry R&D spending even during the 2008 recession.

Strong system of universities as well as basic and applied research institutes.

High public esteem for basic research in the natural sciences, social sciences and humanities.

## Basic research

“It’s not just about having enough industry-focused researchers; we need to keep basic research strong enough to keep the innovation pipeline balanced with input on both ends.”

Gerhard Sagerer, rector, Bielefeld University, Germany

Conference participants agreed that the innovation process is complex, and that models cannot simply be imported wholesale from one national context to another. However, successful innovation systems do appear to include common elements: strong support for basic research; the involvement of students as researchers, innovators and entrepreneurs; support for creativity and risk-taking in research; multidisciplinary collaboration; and strong university-industry ties.

### Basic research is essential

Conference participants affirmed that discovery research driven by curiosity is fundamental to innovation. Basic versus applied research isn’t an either/or choice for universities and funding agencies to make—both are essential to support a strong innovation ecosystem. As Yaacov Michlin, president of Yissum, the technology transfer company of the Hebrew University of Jerusalem, observed, “the university’s role is to do basic research and to do research that benefits society—there’s no tension in doing both.”

German and Israeli participants noted that their countries’ economic prosperity is driven by public and government support for scientific excellence and basic research. Each nation offers extensive funding for the pursuit of fundamental research that can lead to disruptive innovation—and each also achieves highly commercial incremental innovation. Speakers explained how a large part of their success is linked to the fact that the German and Israeli publics understand that their countries are well-off thanks to investments in science and research.



Elizabeth Cannon, president, University of Calgary, Canada; Gilles Patry, president, Canada Foundation for Innovation; Enno Aufderheide, secretary general, Alexander von Humboldt Foundation, Germany; Ruth Arnon, president, Israel Academy of Sciences and Humanities

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## Students

“Educating human capital represents the single biggest contribution by AUCC member institutions to our regions and our nation. Educating students is by far our most important form of technology transfer.”

Meric Gertler, president, University of Toronto, Canada

### Students are vital to innovation

A major theme of conference discussions was the growing efforts by universities and industry to tap into students’ potential as agents of technology transfer, knowledge exchange and entrepreneurship. As researchers, interns and graduates, students from all disciplines, including the social sciences and humanities, are valuable to industry as sources of creative thinking.

Because many of today’s students are increasingly aware of and interested in entrepreneurialism, universities are offering entrepreneurship programs and incubators, fostering peer mentorships and providing campus space for start-ups. Ryerson University president Sheldon Levy noted that Ryerson’s Digital Media Zone (or DMZ) grew from a few students into one of the world’s top university incubators that now supports hundreds of entrepreneurs in Canada and around the world. One of the main priorities of Ben-Gurion University of the Negev, in the words of its president Rivka Carmi, is “student entrepreneurship and teamwork in a competitive global environment.”

Israeli and German universities offer students wide scope for interaction with industry and industry-experienced faculty members. Such opportunities in Canada are fewer but increasing—for instance, the Natural Sciences and Engineering Research Council’s Collaborative Research and Training Experience Program that offers graduate students and postdoctoral researchers both international and industry experience.



Dr. Gertler speaking on the contribution of universities to communities across Canada

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## Risk-taking and creativity

“We need to allow for serendipity in research; you can’t predict where research breakthroughs will come from.”

Alain Beaudet, president of the Canadian Institutes of Health Research

### Innovation requires risk-taking and creativity

Major scientific discoveries cannot be planned. They come from giving creative thinkers the freedom to follow new ideas. This fact, conference participants agreed, underlines the need for research programs and institutional structures that enable innovative approaches and encourage researchers to take risks.

These principles underpin distinctive Israeli and German approaches to research funding. In Israel, a wide range of applied research and commercialization activities are funded in the expectation that some will succeed and many fail—and that failure is itself productive. “Risk-taking in Israel is an everyday behavior,” according to Peretz Lavie, president of Technion Israel Institute of Technology. In Germany, the approach of the Deutsche Forschungsgemeinschaft (German Research Foundation) to research funding prescribes no disciplinary boundaries or quotas and no application deadlines, with the aim of funding the best ideas as they emerge. Encouraging risk-taking and creativity also requires a fresh approach to peer review in order to advance funding for bold new ideas as well as proven researchers and approaches.



Peretz Lavie, president, Technion Israel Institute of Technology

## Multidisciplinary research

“The next scientific revolution will be driven by scientists who have a multidisciplinary view of science, the opportunity to take risks, the infrastructure to work, and the freedom to think.”

Amir Naiberg, president, Yeda Research and Development Company, Weizmann Institute of Science, Israel

### Multidisciplinary research is today's cutting edge

Innovation increasingly emerges from research teams interacting across disciplines—not just the natural sciences and engineering but the social sciences and humanities as well. For this reason, universities are creating campus cultures, programs and physical spaces that encourage interdisciplinary collaboration. These collaborations must extend beyond the campus into local, regional and international partnerships. According to Tel Aviv University president Joseph Klafter, interdisciplinarity is an institutional mandate: “Openness to audacious combinations of ideas and climbing over all fences between disciplines—we take this very seriously.” In Germany, said German Rectors' Conference president Horst Hippler, “companies are interested in the best people from the humanities in order to foster group work and transdisciplinary views.” And in Canada, Canadian Institutes of Health Research president Alain Beaudet reported that CIHR is cooperating with NSERC to fund broad science, technology, engineering and math approaches to health research and Dr. Beaudet envisions working with the Social Sciences and Humanities Research Council to fund social sciences and humanities research into health topics as well.



Rafael Barak, Israeli ambassador to Canada; the Honourable Ed Holder, Minister of State of Science and Technology; Werner Wnendt, German ambassador to Canada

## Collaboration

“The interaction of people with ties to both academia and industry is central to innovation.”

Horst Hippler, president, German Rectors' Conference

### University–industry collaboration

Participants agreed that the excellence of both Germany's and Israel's innovation ecosystems has much to do with the depth of university-industry collaboration in those countries. Industry mentorship and information-sharing fosters academic researchers' awareness of applied research needs—and innovative collaborations emerge when areas of shared fit and benefit are identified. Germany fosters such collaborations by supporting jointly financed shared professorships between academia and industry, as well as joint professorships at university and non-university research institutes. As for Israel, its small size and entrepreneurial culture foster a deep web of relationships between academics and industry.

Importantly, neither Israeli nor German universities offer targeted incentives and rewards for academic researchers to collaborate with industry. Researchers are free to focus on basic or applied research as they choose, with national cultures, practices and relationships sustaining a very high degree of applied research and collaboration.

### Creatively adapting lessons from abroad

A conference high point was the electrifying commentary on Canada's innovation potential offered by Manuel Trajtenberg, former chair of Israel's Planning and Budgeting Committee of the Council for Higher Education. While acknowledging that policies cannot be simply copied from one country to another, he urged Canada to “release the entrepreneurial genie” by following Israel's lead in shaping institutions that let the best and brightest be innovative, in being open to change, and in empowering youth with a ‘can do’ attitude. Israel recognized that its most valued resources are its highly-skilled workers with scientific prowess, and that in order to succeed, it must foster an innovation-based economy. Dr. Trajtenberg explained that Israel's universities, business sector and government worked together to transform Israel into an innovation powerhouse by instilling a culture of collaboration, rewarding failure and allowing risk-taking.



Dr. Trajtenberg encouraging the audience to think about how to instill a culture of collaboration

“Don't look at Canada as it is today but as it will be tomorrow, and at what it will take to maintain your achievements and values in a completely different environment.”

Manuel Trajtenberg, former chair of Israel's Planning and Budgeting Committee of the Council for Higher Education

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## Next steps

“Now is the perfect time to leverage our strengths and to imagine new opportunities. We can do so much through collaboration – domestically and internationally.”

His Excellency the Right Honourable David Johnston, Governor General of Canada

The conference gave participants a series of policy directions to reflect on, for universities and governments in all three countries. The policy dialogue strengthened existing ties among the Canadian, German and Israeli research and higher education sectors and may lead to increased bilateral and multilateral collaboration. AUCC will pursue this goal in ongoing discussions with member universities and other stakeholders in Canada’s innovation system. As His Excellency the Right Honourable David Johnston, Governor General of Canada, has noted, the “diplomacy of knowledge” is increasingly tied to our national well-being. AUCC is committed to exploring new ways to help foster knowledge diplomacy through linkages across borders and disciplines.

Lessons learned from the conference complement the principles and initiatives set out in Canada’s new Science, Technology and Innovation Strategy, released in December 2014, including support for applied and basic research, multidisciplinary and collaboration, the importance of risk-taking, and recognition that people are the most effective agents for discovery and innovation. Canada has the necessary building blocks to become a world leader in innovation; through forums such as these, decision-makers can develop policies and programs to better leverage our assets.

AUCC looks forward to continuing to convene international research and higher education experts in its ongoing policy dialogue series.



Paul Davidson, president, AUCC; Horst Hippler, president, German Rectors’ Conference; Ramona Lumpkin, president, Mount Saint Vincent University, Canada

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### Thank you

AUCC extends its thanks to the Embassy of the Federal Republic of Germany and the Embassy of Israel for their invaluable support for this conference.

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### Website

Please visit our website for additional highlights from the conference:

[www.aucc.ca/innovation-policy-dialogue](http://www.aucc.ca/innovation-policy-dialogue)