Landscape of Business-University Partnerships

April 11, 2012
Ljubljana, Slovenia

International KEN Workshop on “Enhancing Knowledge – Based Growth and Competitiveness Through Business-Academia Partnerships”

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Outline of the Presentation

• Overview of the Landscape in Canada
  • How do businesses and universities interact, and how does government support these interactions?
  • What is the outcome of this support?

• Reasons for Collaboration
  • Why do businesses and universities collaborate?

• Barriers to Collaboration
  • What stands in the way of collaboration growth?

• Best Practices
  • What are best practices in terms of managing intellectual property (IP) and technology transfer offices (TTOs), building relationships, and developing skills?

• The Way Forward
  • How can knowledge transfer and receptor capacity in businesses be enhanced?
Business-University Relationships in Canada

- Variety of arrangements, spanning long-term strategic relationships to short-term targeted relationships
  - Type of relationship undertaken and its duration depends on whether the relationship supports a core strategic business priority or a peripheral exploratory issue
- Companies and universities engage each other in a number of ways, including:
  - Personal relationships (established through post-doctoral programs, internships, researcher exchanges, etc.)
  - Collaborative and contract research
  - Shared resources
  - Co-designed educational programs
  - University researchers on the company’s advisory board
  - Support for research chairs
Identifying Partners for Collaboration

Businesses:
• Seek out world-class expertise in universities
  • Many companies have staff tasked with finding opportunities to partner with universities
• Look within networks
  • Personal relationships are important when looking for a collaborator
• Issue challenges to attract researchers
• Attend conferences where cutting-edge research is presented

Universities:
• Offer co-op and internship programs to students
  • This builds relationships with industry, and gives industry exposure to university capabilities
• Network with industry
• Develop centres of excellence
• Operate liaison programs that provide a portal for industry
• Recruit leading industrial researchers to teach part (or all) of a graduate course
Maximising Opportunities for Successful Business Innovation

• To fund university/college researchers to collaborate with business on industrial challenges and opportunities
  • Collaborative Research and Development Grants
  • Business-led Networks of Centres of Excellence
• To place Ph.D. graduates and graduate students into businesses
  • Internship programs
• To grow companies through direct support to SMEs
  • Industrial Research Assistance Program
  • Voucher programs
## International Comparison

### WEF Global Competitiveness Report

*Business and universities collaborate extensively on R&D.* (20010–11 weighted average)

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### IMD World Competitiveness Yearbook

*Knowledge transfer is highly developed between companies and universities.* (2011)

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1. Reasons for Collaboration

Why do businesses and universities collaborate on research?
The Business Perspective

- Increases research capacity
- Provides access to technology and infrastructure not available in-house
- Increases expertise, including access to talent and potential future employees (i.e., students)
- Can be an alternative to companies conducting in-house research, or can support concurrent internal research
- Ensures that universities provide the training that produces the expertise that industry needs
- Helps companies better prepare for the future by giving them access to cutting-edge research
- Creates a buffer between research and the business cycle
The University Perspective

- Increases relevance of university research
- Provides training for students, including experience working on real world problems within industry timelines
- Provides opportunities for some students to work for short periods in a company
- Increases the awareness in industry of university research
- Generates financing for research
2. Barriers to Collaboration

What stands in the way of collaboration growth?
**Intellectual Property**

- Different universities have different IP policies
- Negotiating IP rights is often a very lengthy and complex process
  - The process time of IP rights is often longer than industry can tolerate
- Differences of opinion between collaborators regarding whose contributions led to commercial success
- Unrealistic expectations that money will be made by universities from collaborations
  - Universities view IP as a concrete way to monetize the impact of knowledge
- Conditions universities put on IP may be too stringent
- Universities want to publish quickly, while companies want the information kept secret
- Lack of flexibility in terms of payment options
Technology Transfer Offices

• Each TTO handles technology transfer differently, depending on its priorities, the subject matter and the university’s IP policies
• Some TTOs are understaffed, underfunded and lack competency
• TTOs are often perceived as being more focused on making money than on getting technology out the door
• Small and medium-sized enterprises (SMEs) may be perceived by TTOs as less important than bigger firms
• TTOs may not understand how much it takes on the business-end for something to succeed commercially
• TTOs often insist on IP negotiations at an early stage when there is little commercial opportunity
Receptor Capacity in Industry

- Canada has a low industrial research base from which to develop partnerships
- Many firms lack ability to absorb ‘cutting-edge’ research
- Many company managers lack basic knowledge about technology transfer and are risk-averse
  - Universities do not provide adequate training in terms of creating firms, managing IP, and working with venture capitalists
  - Schools of Business (Management) are generally not offering curricula designed to prepare students to be research managers or VPs Research of companies
- Firms find it difficult to work with universities
  - Universities need to do a better job of selling their research to Canadian businesses
  - Complicated bureaucracy in universities does not make it appealing for private sector to engage with universities
Other Barriers

With regard to SMEs:

- Difficult for smaller companies to look beyond the short-term burden of collaboration to see the long-term gain
- Collaboration may be viewed as more risky by small companies
- Smaller companies do not have the knowledge or the time required to pursue collaborations
- The tactical nature of the challenges for SMEs does not resonate with universities

Additional barriers:

- Different industries have different requirements, such as longer timelines and more expensive development processes
- Longer time horizons in universities than in industry, and the graduate studies cycle
3. Best Practices

What are the practices that best facilitate collaboration?
Best Practices in IP and TTO Management

• IP management is best framed as a way to promote knowledge sharing rather than as a means to control and limit knowledge flow

• Best practices in companies:
  • Free exchange of non-commercial use now and reserve the right to negotiate commercial use later
  • Additional payments to the licensor if revenues exceed a threshold

• Best practices in universities:
  • For start-up companies, taper any royalty payments or eliminate them in favour of equity
  • Put due diligence requirements on licensing to ensure the technology gets into the marketplace
  • Simplify and standardize the licensing and contract process
  • Increase researcher involvement in disseminating IP and determining its value
  • Consider licensing income as ‘found’ money for which there is no target
  • Staff TTOs with people who have industry exposure and technical degrees
  • Operate a liaison program through the TTO which provides a portal for industry
Best Practices in Building Personal Relationships

• Recognize that the best form of knowledge transfer is on two feet
  • Post-doctoral programs (that last for 2 years or more)
    • Some post-docs will stay with the company, while others go to universities but continue to collaborate with the company
  • Co-operative programs (co-ops) and internships (lasting several months to a year, with mentoring by researchers)
    • Creates a continuing relationship and allows students to apply knowledge from their studies and then take their knowledge gained from work back to the university
  • Adjunct professorships held by company researchers
  • Professors hosted by companies for varying periods of time (days to weeks to years)
  • Networks of company alumni who still feel connected to the company
  • World-class researchers on the company’s advisory board
Best Practices in Skills Development

- University graduates will flourish in an innovation context only if they possess both knowledge-development and business skills and are equipped with the capacity to be entrepreneurial.

- In order to foster these skills, universities:
  - Promote co-ops and internships
  - Support and encourage mentorship and commercialization programs for students by providing access to industry.
  - Allow people from industry to take courses without enrolling in degree programs, and teach short courses for people from industry.
    - This also keeps graduates connected to the faculty and may result in research contracts for the professor.

- Industry also contributes to skills development by:
  - Encouraging people from industry to do sabbaticals in universities.
  - Co-designing programs, which give students the opportunity to work on collaborative, industry-driven research projects.
4. The Way Forward

What are the enabling conditions for collaboration growth?
Enhancing Receptor Capacity in Businesses

• Strengthen co-op and internship programs
  • These improve the ability of companies to receive university researchers
  • The movement of people is the primary means of knowledge transfer
  • Internships can help grow SMEs
• Consider the different innovation aims of the stakeholders and find the areas of compatibility between goals
  • Identify mutual benefits of the cooperation
• Think about "culture“ in industry
• Identify the mechanisms for articulating a vision or common purpose
  • This may be accomplished through industry road maps
Enhancing Knowledge Transfer

- Look at better ways to improve flows of knowledge
  - Re-think traditional IP frameworks and practices to keep pace with a rapidly changing environment and to ensure innovation is promoted, not stifled
  - Think seriously about how to rework and simplify university-industry agreements to free knowledge flows, rather than to constrain them
- New innovation era demands expanded notions of “technology transfer”, models that support open innovation
  - Rather than taking endless time to rigorously protect IP, focus on how to enable more liberal flows of information between the partners
  - Focus on increasing ‘shots on goal’ rather than making money
  - Rewards come via research and learning opportunities, jobs for graduates and philanthropy
- Improve the capacity of TTOs
  - Develop one-stop shops at universities, staffed with qualified and experienced personnel
  - A small number of national technology innovation centres could complement individual TTOs
  - Model of service to a pool of universities can help overcome issues of scale
New Groundbreaking Approaches re - IP

Pennsylvania State University

• Beginning this fall, Penn State University will no longer mandate ownership of intellectual property associated with industry-funded research. The real value is not in IP ownership. VP Research Henry Foley contends, but rather in the contact students and faculty have with real problems in the world.

• The University will “explore an entirely new approach that will make Penn State a friendlier environment for industry-sponsored research, knowing that the companies themselves usually bring a considerable amount of their own IP to the projects.”

• “We’re moving to the position where if a corporation sponsors research with us, they own it. We prefer it.” says Foley. “We’re looking to get the interactions, the relationships and the ability to work on more pressing problems.”

Dow Chemical Company

• Commitment of 250 million over 10 years to support research and education at 11 major universities. Some of the funds are philanthropic in nature. Dow will have the IP rights generated under the program. Such new relationships with universities, rather than on a one project basis, fundamentally alters the business-university partnerships.
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