Regional Innovation & Open Innovation for University: A Case of LINC Program in Korea

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Open Innovation Model for University: Case of LINC Program in Korea

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II. Regional Innovation for University

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V. SCH University LINC Program

VI. Regional Innovation with Open Innovation
1. Key Questions for Regional Innovation

**Local Community**
How to create wealth of region by technology driven industries with HRD & R&D

**Enterprises**
How to enhance the technology & marketing competitiveness to survive in the global market

**Economic Development Via Regional Innovation**

**Government**
How to obtain the budget and policy for University-Industry Cooperation from Congress

**Universities/Research Institutes**
How to successfully conduct R&BD and HRD for the demand of Enterprises
## 2. Problem Statement

### <As is>

<table>
<thead>
<tr>
<th>University</th>
<th>Professors</th>
<th>Students</th>
<th>Local Firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Avoiding Cooperation</td>
<td>- Low interest in Coop</td>
<td>- Gap in Education &amp; Job</td>
<td>- Passive Cooperation</td>
</tr>
<tr>
<td>- Government Dependent</td>
<td>- Education by Theories</td>
<td>- No Info on Local Firms</td>
<td>- Low Interest in Local Univ.</td>
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</table>

### <To be>

<table>
<thead>
<tr>
<th>University</th>
<th>Professors</th>
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<th>Local Firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Coop Friendly Programs</td>
<td>- High interest in Coop</td>
<td>- Ties in Education &amp; Job</td>
<td>- Active Cooperation</td>
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<tr>
<td>- Self Development of Coop</td>
<td>- Education by Field Work</td>
<td>- Good Info on Local Firms</td>
<td>- High Interest in Local Univ.</td>
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</tbody>
</table>
I. INTRODUCTION

3. Solutions for University

**National Agenda**

- How can university & industry work together for regional innovation?
- How can university adapt the demand of industries for R&D and HRD?

**Possible Solutions**

- Creating a Model for University-Industry Cooperation
- Extension of the Diversified University-Industry Cooperation

**University Policies**

- Active and Sustainable Programs for University-Industry Cooperation
- Participation of all Colleges & Majors in University-Industry Cooperation
1. Concept of Regional Innovation

The regional innovation system may be drawn conceptually and organizationally around the economic, social, political and institutional relationships that generate a collective learning process within a related group of technological or functional areas.

The regional innovation system encourages the rapid diffusion of knowledge, skills and best practice within a geographic area larger than a city, but smaller than a nation.

WIKIPEDIA: Ontario Network in the Regional Innovation System (August 19, 2009)

A regional innovation platform is a hub for science & technology innovation, production system innovation, and business service innovation by a network of enterprises, universities, research institutes, governments, and business service agencies. Hak-Min Kim (2003)
II. Regional Innovation for University

2. Triple Helix Model

Triple Helix = a spiral model of innovation that captures multiple reciprocal relationships at different points in the process of knowledge capitalization

First dimension:
Internal transformation in each of the helices, such as the development of lateral ties among companies through strategic alliances or an assumption of an economic development mission by universities.

Second dimension:
Extension of the sphere to university-industry-government relationship as one of relatively equal, yet interdependent, institutional spheres which overlap and take the role of the other.

Leydesdorff & Etzkowitz (1998)
II. Regional Innovation for University

3. Knowledge Supply Chain

Wayne Johnson (2008)
II. Regional Innovation for University

4. Regional Innovation Platform by Science & Technology Park

- Universities/Research Institutions: Supply of High Technology Research & Human Resources
- Governments: Inducement & Arrangement for Funding, Information, Policy / Cooperation with Industry and University
- Science & Techno Park: Base for Innovative System of Regional Technology / Linkage of Industries & Universities
- Enterprises: Improvement of Commercialization/Absorption/Utilization of New Technology

Total Support: Policy Consulting
Policy Support: Industry Growth
Funding Support: High Development of Regional Industries
Activity Support: Practical use for Technology Transfer
Development Costs: Joint Researches

Technology Transfer: Development Costs
II. Regional Innovation for University

5. Completion of Regional Innovation System

- Governance & System
- Facilitator/Coordinator
- Social Capital: Culture
- Incentives (Finance)
- Government Support System
- Physical Infrastructure
- Knowledge Infrastructure
- Technology Infrastructure
- Innovation Infrastructure (Universities & Research institutions)
- Key Enterprises in Specialized Industry
  - Cooperation Enterprises (Front Industry)
  - Supporting Enterprises (Rear Industry)

Andersson and Karlsson (2002)
### 6. Components of Regional Innovation System by Activities

<table>
<thead>
<tr>
<th>Categories</th>
<th>Innovation Activities</th>
<th>Indirect</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Direct</strong></td>
<td><strong>Formal</strong></td>
<td><strong>Informal</strong></td>
</tr>
<tr>
<td>Innovation Network</td>
<td>Innovation Patterns</td>
<td>Innovation Patterns</td>
</tr>
<tr>
<td>- Enterprises</td>
<td>- Trust among Client &amp; Suppliers</td>
<td>- Collaboration among Enterprises</td>
</tr>
<tr>
<td>- Universities &amp; Research Institutes</td>
<td>- Collaboration among Scientists &amp; Enterprises</td>
<td>- Collaboration among Scientists &amp; Enterprises</td>
</tr>
<tr>
<td>- Supporting Orgs (TTL...)</td>
<td>- Familiarity of Technology Policy</td>
<td>- Value of the Region</td>
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<tr>
<td>- Technology Policies</td>
<td></td>
<td><strong>Cultural Factors</strong></td>
</tr>
<tr>
<td><strong>Indirect</strong></td>
<td><strong>- Education Supporting Environment</strong></td>
<td><strong>- Education Supporting Environment</strong></td>
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</table>
II. Regional Innovation for University

7. Role of University in Regional Innovation System

Can a university function as a regional innovation platform?
1. Paradigm of Open Innovation

- Firms can & should use external & internal ideas, and internal & external paths to market.
- Firms can combine internal & external ideas into systems based on the business model.

Chesbrough (2003, 2006)
III. Open Innovation for Universities

2. Closed vs Open Innovation

Closed Innovation System

Based on the concept that successful innovation requires control, companies generate their own ideas that they would then develop, manufacture, market, distribute and service themselves.

Open Innovation System

Based on the concept that not all good ideas are developed within the own company, not all ideas should necessarily be further developed within the own firm’s boundaries.

Source: Chesbrough (2003) and modified by Chesnrough (2009)
### Closed Innovation Principles

- The smart people in the field work for us.
- To profit from R&D, we must discover it, develop it, and ship it ourselves.
- If we discover it ourselves, we will get it to the market first.
- The company that gets an innovation to the market first will win.

### Open Innovation Principles

- If we create the most and the best ideas in the industry, we will win.
- External R&D can create significant value: Internal R&D is needed to claim that value.
- We don’t have to originate the research to profit from it.
- Building a better business model is better than getting to the market first.
- If we make the best use of internal and external ideas, we will win.
- We should profit from others’ use of our IP, and we should buy others’ IP whenever it advances our business model.
III. Open Innovation for University

New Thinking: Open Innovation

4. Linear-Hybrid-Open Innovation Model

Wayne Johnson (2008)
III. Open Innovation for University

5. Level of Open Innovation

Levels of Engagement Activities

- Awareness
  - Career Fairs
  - Interviews
  - EDU Account

- Involvement
  - Industry Affiliates/Advisory Program
  - Research Grants
  - Internship/Co-op
  - Software Grants

- Support
  - Student Consultant
  - Hardware Grants
  - Curriculum Dev/ABET Support & Fundraising
  - Workshops/Seminars
  - Support Contract
  - Student Organizations Sponsorships
  - Philanthropic Support
  - Guest Speaking/Lectures

- Sponsorship
  - University Initiative Sponsorship
  - Undergraduate Research Program Support
  - Graduate Fellowships
  - Collaborative Research Program Report
  - Outreach Programs
  - Support for Proposals for Education (NSF, NASA, etc.)
  - BETA Programs

- Strategic Partner
  - Executive Sponsorship
  - Joint Partnership
  - State Education Lobbying
  - Major Gifts
  - Business Development

Traditional Engagement

Phase One
- Awareness
- Involvement

Phase Two
- Awareness
- Involvement
- Support

Phase Three
- Awareness
- Involvement
- Support
- Sponsorship

Phase Four
- Awareness
- Involvement
- Support
- Sponsorship
- Strategic Partner

Phase Five
- Awareness
- Involvement
- Support
- Sponsorship
- Strategic Partner

Holistic Engagement

Key:
1. Recruiting
2. Education Sales
3. UR Account Managers
4. UR Programs
5. UR Research
6. Other (Philanthropy, Alumni, Executive)
III. Open Innovation for University

6. Role of University in Open Innovation

Can university utilize open innovation system?

Central & Local Governments

Large & Small Companies

R&BD + HRD @ UNIVERSITY

Research Institutes & Professional Service Providers

Contribution to National and Regional Innovation
**1. Outline of LINC Program**

**IV. LINC Program by the Korean Government**

**LINC = Leaders in INdustry-university Cooperation**

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<thead>
<tr>
<th>Issues</th>
<th>Contents</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>Program Years</td>
<td>2012-2017</td>
<td>5 Years</td>
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<tr>
<td>Budget</td>
<td>200 Million US $ per year</td>
<td>Total 1 Billion US $</td>
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<tr>
<td>Types of Programs</td>
<td>Technology Innovation</td>
<td>15 Graduate Schools</td>
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<tr>
<td></td>
<td>Practical Field HRD</td>
<td>35 Undergraduate Schools</td>
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<tr>
<td>Evaluation Criteria</td>
<td>System for Coop</td>
<td>University System</td>
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<td></td>
<td>Component for Coop</td>
<td>University Curriculum</td>
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<td></td>
<td>Link for Coop</td>
<td>Industry Partnership</td>
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2. Vision, Goal & Strategies of LINC Program

IV. LINC Program by the Korean Government

Vision
Partnership between University & Industry for Regional Innovation in Open Innovation

Policy Goal
Development of 50 Universities for Various Industry Cooperation Models

Project Strategies
- Extension of University-Industry Cooperation
- Development of Diversified Cooperation Model
- Sustainability of University-Industry Cooperation
1. Vision and Goals

SCH Vision

UNITOPIA 2020

- 2 Top 100 in the World Universities

Project Vision

Best R&D & HRD in Medi-Bio & New IT Convergence Industry

Project Goals

Participants of LINC Program: 1,000 Students / Year
- 200 Labs
- 1,000 Companies

Project Items

- Smart LINC
  - Open Innovation for All Colleges And Majors
- Creative LINC
  - Open Innovation for Medi-bio & New IT Convergence
- Harmonious LINC
  - Regional Innovation Win-Win Industry – University Coop

Hak-Min Kim et al (2012)
V. SCH University LINC Program

2. SCH LINC Model for Open Innovation

Strength of SCH LINC: All time Openness, Specialization, Creativity, Flexibility, Agility
3. SCH LINC Structure (Centers)
4. SCH LINC Center

- Lab-based Cooperation Program: 250 Labs
- Professor–Enterprise Co-R&BD Projects: 250 projects
- Family Company Development: 1,000 Companies
- Operation of Industrial Association: 8 Associations
- LINC Hospital: Problem Clinic for Enterprises with Difficulties
5. SCH Start-up Center

- Start-up Education: 60 programs / year
- Entrepreneurship Classes: 35 classes / year
- Start-up Students: 250 people in 40 Groups
- Start-up Camps: 20 Programs
- Operation of Start-up Supporting Pools (Mentors)
6. SCH LINC Internship Center

- Practical Field Training: 1200 students / year
- Capstone Design Class: 400 Classes
- Job Fair Festival: 500 job matching
- Re-Training Program for Graduated: 100 people
- LINC Student Portfolio Management: 2,000 students / year
7. SCH LINC Coop Education Center

- New Coop Education Program: 20 Majors for Fusion Technology
- Evening Classes for Employees: Fusion Mechanics Program
- Family Company Development for Technical Training: 250 companies
8. SCH LINC Technology Transfer Center

- Technology Patent Management: $80/year
- Technology License Transfer: $120/year
- Technology Commercialization: 25 start-ups/year
- Technology Investment: $15 Million
9. SCH LINC Facility Equipment Center

- International Reliability Assessment Center: US$ 6 Million
- Equipment & Technical Training: 500 persons/ year
- Equipment Database for Family Enterprise: 300 companies/ year
10. Effects of SCH LINC Family Enterprises

<table>
<thead>
<tr>
<th>Activities</th>
<th>Effects</th>
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<tr>
<td>- Co R&amp;D</td>
<td>Increase of Productivity</td>
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<tr>
<td>- Tech Innovation</td>
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<td>- Management Support</td>
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<td>- Practical</td>
<td>Obtaining High Quality Employees</td>
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<td>- Training Internship</td>
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<td>- Capstone Design</td>
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<td>- Medical Services</td>
<td>Enhancement of Welfare</td>
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<td>- Education Services</td>
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<td>- Sports Services</td>
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Win-Win Partnership Between SCH Univ. & Local Industry
1. Role of Universities

- R&BD
  - Collaboration R&BD
  - Contracted R&BD

- Technology Transfer
  - Licensing for Royalty
  - Trading for Investment

- Manpower Supplying
  - Enterprises Jobs
  - R&D Related Jobs

- Entrepreneurship
  - Creating Enterprises
  - Business Development

VI. Regional Innovation with Open Innovation: Conclusion

Benefits for Professors & Researchers in Academy & Business Areas

Benefits for Students in Recruiting Jobs & Creating Business
VI. Regional Innovation with Open Innovation: Conclusion

2. Role of Science & Technology Park
3. Role of Business Service Providers

- **Service Providers**
  - Business Service Operation
    - Investment Opportunity
      - Financial Investment
      - Business Contract
    - Legal & Marketing Biz
      - Contract Fee Collection
      - Investment Incentives
    - Project Beneficiary
      - Government Grant
      - Policy Developer
    - Service Industry
      - Creating New Biz
      - Job Creation in Service
4. Role of Governments

Central Government
- Policy-Making
  - Start-up (SME) Policy
  - Innovation (R&BD) Policy
- Financial Support
  - R&BD Grants
  - Private-Public Fund
- Program Support
  - Local Industry Program
  - Local Firm Promotion
- Financial Support
  - Matching Central Govt
  - Local & Angel Fund

Local Governments

Governments

National Benefits by Creating Jobs and Increasing Incomes via National Innovation System

Local Benefits by Creating Jobs and Increasing Incomes via Regional Innovation System
Yes, a university can function as a regional innovation platform when it has an open innovation system.

Regional Innovation by Active People:
Learning => Networking => Interaction => Innovation => Dynamic Development
References


Wayne Johnson (VP of HP for University Relations Worldwide)
January 10, 2008 (http://www.ncsu.edu/iucrc/Jan'08/WayneJohnson-IUCR_Ctalk-10JAN08.pdf)


http://www.triplehelixconference.org (2011)

http://www.ict-slovenia.net/eng/about-technology-network/triple-helix
Beyond Cooperation, SCH LINC!

Thanks for your attention.