Higher Education Reform Programs to enhance University-Industry Collaboration in Korea

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Introduction
Introduction to Korea

- Within 3 hrs distance from Seoul,
  1) 61 metropolitans having more than 1 million population
  2) 1/3 world population
  3) 20% of World GDP
  4) Purchasing power more than USA

- Area: 99,720 km²
- Population: 49,040,000
- GDP: 11th in the world in 2017
- Global Companies: Samsung, Hyundai, LG
- Web connection: over 80% of the households

UK-East Asia Higher Education Partnerships for Industry Engagement
GNI Trend of S. Korea

Bank of Korea

US$ 30,000

27,560

22,170

20,000

15,000

10,000

5,000

0

1970

1980

1990

2000

2010

2016

Labor Oriented

Capital Oriented

KSEE 1993

OECD 1996

KSIC 2011

Industry 4.0

Knowledge-based industries

Tech Oriented

Industry Complaints!!

Export-oriented industries

Capital-intensive industries

Electronic/High-tech industries

Restructuring Period

Expansion Period of Tertiary Education

Expansion Period of Secondary Education

Capital-intensive Heavy-chemical industries

Export-oriented Capital-intensive Heavy-chemical industries

Regional Policy Forum

UK-East Asia Higher Education Partnerships for Industry Engagement
Development of Technology and I-U Cooperation

- **1950**: Destruction by Korean War
- **1960**: Importing Technology (Turn-Key Base)
- **1970**: Technology Development (Reverse Engineering)
- **1980**: Developing Domestic Technology
- **1990**: Promoting Technological Advancements
- **2000**: Creating Technology in the high-tech Industries
- **2010**: Developing the future-promising Technology

**Key Events**
- **1960-1970**: Importing technology and developing reverse engineering.
- **1980-1990**: Focusing on developing domestic technology and promoting technological advancements.
- **2000-2010**: Creating technology in high-tech industries and developing future-promising technology.

**Institutions**
- **1950**: Technical and Vocational Schools
- **1960**: Public Research Institutes
- **1970-2010**: University as the hub for I-U Coop
Challenges in Education by Academia

- Decrease in College-Eligible population

- High school science curriculum and teaching pedagogy
  - Not enough science subjects are offered

- Research-emphasized faculty evaluation system
  - Research is emphasized regardless of each college’s research infrastructure and capability

- Curriculum is designed to give the basics of each field, but not enough to get in-depth and/or broad knowledge of the field.

- Lack of opportunities for hands-on experience and research
  - Low quality lectures and equipments for undergraduate laboratory
Training a new engineer to be self-sufficient takes an average of 3 years

Mismatch of supply and demand in engineering disciplines and levels of skills
- Lack of IT engineers vs. overflow of engineers in conventional fields

Engineering curriculum
- Insufficient up-to-date industrial examples in course materials

Reference:
Engineering led economic growth in the 1970s and 1980s!

Now?

- **Professors**: Concentrate on researches, but the application of results are restrictive
- **Students**: Lack of practical skills and knowledges
- **Companies**: Complain to university, but passive for cooperation with university

How should the changes take place?
Leaders in INdustry - university Cooperation (LINC) Project by MOE
LINC (Leaders in INdustry-university Cooperation)

- Launched in 2004 (HUNIC - Hub University for Industrial Collaboration)
- 2012-2016 (LINC - Leaders in Industry-university Cooperation)
- Main Objective: to develop engineering education programs and strategies to enhance collaboration with regional industries.
- Total university: 86 Universities (4-years: 56, 2-years: 30)
- Total budget: USD $260 Million
- Main Programs

- Human Resource Training for Industry-University Cooperation
- Industry Support for Enhance the competitiveness of enterprises
- Program Support for University Specialization
**Government Sponsored Project (II)**

**LINC+ (Leaders in INdustry-university Cooperation+)**

- Reorganization of university system to industry-university cooperation friendly system
- Operation of industry-university cooperation friendly curriculum (Internship, Capstone Design)
- Reinforcement of enterprise network
- Construction of local community ecosystem

- **Duration**: 2017~2021 (2 years+3 years)
- **Participants**: 99 Universities nationwide (4-year: 55, 2-year: 44)
- **Total budget**: $327 Million / year
- **Support Organization**: Ministry of Education (MOE) and National Research Foundation of Korea (NRF)
Overview of LINC+ Project Programs

- **Reorganization of University system to industry-university cooperation friendly system**
  - Employing faculty members with industry career
  - Offering convergence interdisciplinary majors
  - Designing education programs incorporating industry cooperation

- **Nurture skilled manpower to reinforce industry-university cooperation**
  - Customizing curricula according to the industry demands
  - Internship and capstone design course
  - Education on startup and career planning
  - CSI (CT, ST, IT) specialized programs

- **Customized support for competitive enterprises**
  - R&D
  - Employee training
  - Utilizing the public equipment
  - Industry-University cooperation council
  - Customized total enterprise support (All-set)

- **Creating a local community ecosystem**
  - Operating community council
  - Industry-University cooperation council
  - Win-Win cooperation agreement with community
  - Support in education, employment, business start-up
  - University-Community-Industry Interactive Cooperation

**Regional Policy Forum**

UK-East Asia Higher Education Partnerships for Industry Engagement
# LINC+ Project - University System

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<tr>
<th>Sub-project Title</th>
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</table>
| Faculty Evaluation System Emphasizing Industry Cooperation | Reflection of industry cooperation achievements in faculty evaluation  
- Addition of industry activity evaluation item to three evaluation categories (education, research, industry cooperation)  
- Heavy weight on industry activity for promotion and reappointment |
| Employing Faculty with Industry Career | Hiring faculty members with industry career to innovate university education, enhance the employment rate, and encourage startup |
| Designing Education Program Incorporating Industry Cooperation | Merge the master and doctorate program to remove the barrier against industry cooperation  
Customize curricula according to the industry demands and open curricula by the industry contract |
# LINC+ Project – Education Programs

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<tr>
<td>Offering convergence interdisciplinary majors</td>
<td>Open industry-demand interdisciplinary majors&lt;br&gt;- Design engineering, e-commerce, culture planning, consumer science, etc&lt;br&gt;- Techno-management convergence, startup, art-engineering-management convergence</td>
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<tr>
<td>Industry-driven track</td>
<td>Curricula based on industry demands&lt;br&gt;- Department: multi-media engineering&lt;br&gt;- Track: multimedia contents and signal processing, entertainment computing, wire/wireless network and information processing, display arts, movie making technology</td>
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<tr>
<td>Internship and capstone design course</td>
<td>Found an internship support center supervising the internship process&lt;br&gt;- Investigation on demands on field placement, prior education, field instruction, education, training/employment connection&lt;br&gt;- Field placement: more than 4 weeks (160 hrs, 40 hrs/week)&lt;br&gt;- Capstone Design: 3, 4th year students/subject name “Capstone Design”</td>
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<tr>
<td>Education on startup and career planning</td>
<td>Found an entrepreneurship education center to encourage to start venture companies&lt;br&gt;- Evaluation on the number of entrepreneur, space for startups, financial support for entrepreneurship and its staff</td>
</tr>
<tr>
<td>Specialized program</td>
<td>HR training, technology development and commercialization for specialized program of University&lt;br&gt;- Program: nurturing the next-generation convergence culture contents industry&lt;br&gt;- HR training: art-engineering-management convergence education, media convergence contents education&lt;br&gt;- Research and commercialization: Engineers Atelier (EA), Contents value-up</td>
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### LINC+ Project – Industry & Community Support Programs

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<tr>
<td><strong>Industry-University Cooperation Council</strong></td>
<td>Operation of council through grouping according to the Industry with University &lt;br&gt;-Specialized group between professors and industries &lt;br&gt;-Support for activities including conference, seminar, technical consulting, education employee training etc</td>
</tr>
<tr>
<td><strong>Customized Total Enterprise Support (ALLSET)</strong></td>
<td>Solve the problems of the Participating Companies&lt;br&gt;-Solving the problem of labor, taxation, accounting, management, patent and investment</td>
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<td><strong>R &amp; D</strong></td>
<td>Activation of research, commercialization for development of cutting-edge convergence industry</td>
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<td><strong>Employee Training</strong></td>
<td>Re-training of Participating business and support for education on new technology improvement</td>
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<tr>
<td><strong>Public use of equipment</strong></td>
<td>Operation of public facilities and equipment for supporting product development and project of Participating businesses &lt;br&gt;-Supporting motion capture device, 3D printer/ scanner, 2D/ 3D video editing equipment, 3D diagnosis scanner, video-related equipment, BT-related device for mid/small sized businesses with cheap price</td>
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