International Collaborations at POSTECH and Korean Perspectives

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Pohang, KOREA
City of Pohang

Located in the southeastern area of Korea
Coastal city of 530,000 inhabitants

Home of POSTECH & POSCO*

* POSCO: Pohang Iron & Steel Corporation
POSTECH Overview

- Founded in 1986
- Faculty: 412 (268+144)  
  International: 16.7%
- Students: 3,612  
  1,422 (undergraduate)  
  2,190 (graduate)  
  International: 5%
- 320 freshmen per year representing top < 1% of high school graduates
- Undergraduate students/faculty: 3.5 to 1
- Researchers: 636  
  International: 11.6%
- Staff: 392
  $200M for research

Academic Programs

- 11 Departments  
  4 in Science  
  7 in Engineering
- 11 Divisions, Schools & Institute
- Courses taught in English  
  Undergraduate: 63% (major only)  
  Graduate: 98%
26 Years Young

POSTECH successfully settled in Pohang, owing to
• Founder’s visionary leadership
• Unprecedented large-scale financial support from POSCO
• Creative strategies that attracted talented scientists and students

World Bank, 2010
The Road to Academic Excellence

Since 1996, JoongAng Daily ranked POSTECH #1 among Korean universities 7 times

1998 Asia’s best science and technology university by AsiaWeek

2010 28th by the Times Higher Education World University Rankings

• SCI papers: 1,539 (2011)
• SCI/faculty*: 5.54

• Graduates (1990~2012): 14,393
• Ph.D.: 2,231
• MS: 6,540
• BS: 5,622

* Tenure-track faculty
Challenges in Higher Education

- Broad attack and steady erosion of public support and confidence in higher education
- Commoditized higher education and no differentiation
- Research vs. education
- Fundamental changes in the society
- Rapidly-advancing technologies and fast-changing global industry
- Greater accountability and scrutiny
- Maintain and improve the quality when the resources are constrained
- Is the glass half full or half empty?
Why Internationalize?

- To develop diverse learning and research environments and culture: the value of diversity
- To prepare our students, both Korean and international, to become future global leaders
- To attract leading scholars and students from around the world
- To move POSTECH to a next level of excellence
International Programs at POSTECH

- Student mobility: 5% of our students per year go abroad for > 3 months
- Distinguished foreign professors
- Distinguished lecturers
- Global leadership program
- Cooperation with developing countries
- WCU (World Class University) programs
- IBS (Institute for Basic Science) campus site labs
Research Platforms and Institutes

National and international projects to host and build key research infrastructures and institutes for the advancement of the R&D competency of Korea

**PAL XFEL**

Pohang Accelerator Laboratory
X-ray Free Electron Laser
3rd generation 3 GeV accelerator
4th generation light source being built
0.1-nm hard X-ray 10-GeV XFEL
Length: 1.1 km
Budget: $400M

**Max Planck**

Max Planck Korea established in POSTECH
Center for Attosecond Science & Center for Complex Phase Materials

**APCTP**

Asia Pacific Center for Theoretical Physics
Headquartered in POSTECH
Pursue theoretical physics and promote collaboration among its member countries
Issues

• Generous government support, but its associated overhead is large
• Substantial and meaningful partnerships
• Outstanding faculty recruitment and retention
• Silo mentality, and many faculty do not feel the need
• Still homogeneous rather than diverse
• Too many academic units
• Bilingual Campus
• Internationalization: a tool to help realize our goal rather than to raise the rankings and/or become an achievement itself
Korean Higher Education

Very Successful in Quantity

- Colleges and universities proliferated
  About 400 colleges and universities
- 3.5 million undergraduates enrolled
  (6-fold increase since 1980)
- 330,000 graduate students enrolled
  (10-fold increase since 1980)
- 82% of high school graduates go to colleges (1st among OECD)
- 63% Higher Education Achievements in 25~34 yrs (1st IMD*, 2011)

• Korean students studying abroad: 251,887 (2010)
• Korean students studying in U.S.: 72,000, 3rd ranks (2009)
• International students in Korea (2010): 83,842, 5-fold increase since 2004

* IMD: International Institute for Management Development

But not quite in Quality

Low global recognition of universities:
3 Korean universities in top 200 of THE (2011)

Number of international students: 1/3 of outbound

Low number of international scholars: 2% (FTE)
International Programs in Korea

- **Institute for Basic Science (IBS)**
  Leap to the world’s top-10 research institute in basic sciences
  50 site labs, each with ~$10M/year

- **World Class University Program (Scholars)**
  Attract outstanding scholars from abroad to vitalize education and research and raise its quality

- **Global Korea Scholarship (Students)**
  Scholarship granted to 1,200 students from home and abroad per year

- **Campus Asia**: Mobility programs among Korea, China, and Japan

- **Global Research Laboratory Program**
  Develop collaborative research programs with the world-leading research groups

- **Global R&D Center Program**: 
  Host world-class research centers in Korea

- **ODA (Official Development Assistance)**
  Share Korea’s experience with the developing countries and provide support
Issues

- Too many programs?
- Imbalance between outbound and inbound students
- English lectures
- International scholars: not enough contributions to education & research so far
- University rankings: particularly influential in Asia
- Unhealthy (?) academic power distribution
- Roles of government
- Lack of patience and consistency
Ingredients for a High-Impact Academic Unit

• Outstanding faculty
• Well-trained future leaders in our students and postdocs
• Critical mass
• External research funding
• Research leadership and risk-taking
• IP and technology transfer
• Mutually-beneficial relationship with industry
• Excellent staff
• Excellent facilities and infrastructure
• Support from government, industry, institution and individuals
• Culture of excellence
• Entrepreneurial and collaborative spirit
• Stable and innovative leadership
Innovation & Technology Commercialization Stages

- Basic research, discovery
- Valley of death
- Feasibility study, prototype
- Product design
- Product development
- FDA, CMS
- Clinical use
Conclusion

- There are numerous challenges that universities face
- Crisis everywhere, but opportunities abound
- Resources are available in Asia, but how long?
- Internationalization is very important, but how much?
- Pursuing excellence requires a fundamental culture change
- Many opportunities for collaboration

POSTECH’s Vision with Internationalization and Excellence

- **Become a great place for learning**
  - where inspired students can learn from inspiring professors

- **Be recognized as an outstanding research institution**
  - where faculty, students and graduates pioneer and lead science and technology fields and discover solutions to the world’s grand challenges through innovation and collaboration
Thank you!

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