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*

* POSTECH: Pohang University of Science and Technology
* 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

- Operating budget: ~US$300M (2011)  
  excluding the accelerator.  
  $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)

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)

* IMD: International Institute for Management Development
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
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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