A Private Path to a World-Class Research University

Why POSTECH?

- One of the top tier research universities in S. Korea
  - National - Seoul National University, KAIST
  - Private – POSTECH, Yonsei University, Korea University

- Private
  - Established by a private company, POSCO (Pohang Iron and Steel Company)

- Relatively new
  - Opened in 1987
Things we can learn

- What has POSTECH achieved over the last two decades?

- What makes POSTECH build a strong reputation as research university over the relatively short period of time?

- What challenges is POSTECH facing?

Contribution

- Providing policy-makers and university administrators in developing countries with practical implications for how to build a world-class university
Korean higher education system

- **407 colleges and universities in 2009**
  - Four-year universities (177 HEIs) and two-year junior colleges (146 HEIs) are dominant
  - 87% private
- **3.5 million undergraduates**
- **73 thousands full-time faculty**
- **A large private share but heavy external controls**

History

- **Chinese influence until the late 19c**
  - Students learned Chinese cannons at traditional institutions of higher learning (12c-19c)
- **Japanese influence during the colonial period (1910-1945)**
  - Only one imperial university (later Seoul National University) existed. No other college level education was allowed.
- **U.S. influence (late 19c to date)**
  - Early missionaries in 19c
  - U.S. military government (1945-1948) and U.S. aid (1950s-1960s)
- **Number of HEIs exploded since 1945**
  - About 80% high school graduates advance to C&Us in 2009
  - A widening gap between the capital and other areas
    - “Send your kids to Seoul and your horses to Jeju island”
Background: POSTECH

- Local
  - Located in Pohang, a mid-size coastal city with over 0.5 million residents (the home of POSCO, the world’s second largest steel producer)
  - About 360km away from Seoul, the capital city of S. Korea

- Small
  - 1,400 undergraduate and 1,700 graduate students
  - 4 science and 6 engineering majors along with a general education program
  - 244 full-time faculty and 780 researchers
  - 267-acre (1,080 km²) campus
Pohang

POSTECH campus
Social conditions in 1980s

- **Economic & Policy dimension**
  - POSCO’s need for advanced research and technology development for sustainable growth
  - Need for talented engineers in such national strategic areas as heavy and chemical industries
- **Social dimension**
  - Local community’s need for higher education
- **Higher education system dimension**
  - Need for differentiating HEIs
  - Enhancing a regional balance in providing higher education services

POSTECH’s achievements

- Top 2% students since the foundation
- Asia’s Best Science and Technology University by AsiaWeek (1998)
- Ranked 11th in citation per faculty worldwide by The Times (2007)
- Aiming at becoming a top 20 world-class research university by 2020
Key Success Factors: Good Start

- **Vision**
  - Had a clear vision of becoming a research university

- **Faculty**
  - Recruited internationally renowned faculty abroad (60-70%) and provided them with excellent research environment

- **Student**
  - Recruited academically well prepared students by setting a very competitive standard for admission and providing them with full scholarship as well as on-campus residence
  - Started to recruit graduate students early

- **Planning, management, and support**
  - Learned from failure
  - Imported an advanced administrative system and competent administrative staff from POSCO
  - POSCO’s financial support

Key Success Factors: Governance

- **Leading by outside persons but institutional autonomy guaranteed**
  - The board of trustees deliberates and makes decisions on the university’s major policies over a general management of the university
  - The current trustees are mostly academic and industrial figures from outside the university (14 trustees with a four-year membership)
  - Although the chairman of the board has been influential but granted the managing authorities to the president, such as an appointment of the academic staff
Key Success Factors: Management

- **Strategic planning: Vision 2020**
  - A top 20 world-class university by 2020
  - Core strategies
    - Promoting ‘selection and focus’ – Developing high impact research
    - Collaboration among research groups – Split appointment
    - Globalization – English lectures

- **Empowering the middle**
  - No fixed term for the department chairs
  - Department chairs manage their own department independent from the headquarter of the university: faculty hiring and evaluation
Key Success Factors: Management

- Recognizing internal coalitions and communicating with them
  - Faculty senate and faculty council (representatives)
  - Administrative staff association, student association, labor union
  - University council (11 faculty, staff, student representatives)

- Performing high impact research
  - Citation index per faculty (10 times per paper) – world’s top 20
  - Integrated field of chemistry and life science as well as material and device are outstanding
    - Reinforcing strategic selection and resource allocation, collaborative research, and international research collaboration
  - Active international research partnership
    - Max Planck Institute in Germany
    - RIKEN in Japan
Key Success Factors: Management

- Strengthening knowledge transfer
  - On-campus research collaboration between POSTECH and a private research center, Research Institute of Industrial Science & Technology (RIST)
    - POSTECH’s faculty used to work at RIST as adjunct researcher until 1998
  - Expanding research collaboration with Samsung, LG, Hyundai, as well as ExxonMobil
  - Running POSTECH Venture Capital Cooperation since 1997 and Venture Business Incubation Center since 1998, and ‘University-Industry Cooperation Technology Holding Company’ for the commercialization of high tech by POSTECH

Key Success Factors: Finance

- Securing sustainable finance
  - Financial income – 200 billion KRW (166 million USD) in 2008
  - Source of revenue
    - Research income: 50%
    - POSCO through university corporation: 25%
    - National support: 15%
    - Tuition: 10%
  - Endowments
    - 1.3 trillion KRW (1.1 billion USD) in 2009 (mostly POSCO stocks)
Key Success Factors: Government

- Increasing role of government
  - The central government’s financial contribution to POSTECH gradually increased
    - Brain Korea 21 (1999-2012)
    - World-Class University (WCU) (2009-2012) – 84 billion KRW to invite 23 distinguished international scholars to collaborate in education and research
    - Research infrastructure: Pohang Light Source (PLS) – 60 billion KRW and now planning to support for the foundation of the fourth PLS (400 billion KRW worth)
    - Other ministries’ support: National Center for Nonomaterials Technology, Pohang Institute of Intelligent Robotics, National Defense Micro Electro Mechanical Systems etc.

Challenges for POSTECH

- Changing external environment
  - Increasing competition among universities
    - Foreign higher education institutions in Incheon near Seoul
    - New Science & Technology universities nearby
    - A rapid progress of national universities in the field of science and technology such as Seoul National University (SNU) and Korea Advanced Institute of Science & Technology (KAIST)
  - Increasing faculty mobility
Challenges for POSTECH

1. **Strengthening undergraduate education**
   - Despite the university’s continuous efforts to improve the quality of education, the faculty has been less interested in the undergraduate education
     - No easy answers
     - Center for Excellence in Education plans to assess undergraduate students’ learning outcomes and to use the assessment results to improve teaching and learning practices and curriculum

2. **Enhancing globalization**
   - Currently the proportion of foreign professors at POSTECH is about 10% and graduate students about 4%
   - The university focuses on making a steady increase in the number of foreign faculty, students and English lectures, targeting 20% foreign faculty, 15% graduate students and 70% English lectures by 2020
   - Nevertheless, achieving the goal would not be easy unless the constituents’ mindset and the university’s administrative system as well as living conditions outside of the campus are improved
Challenges for POSTECH

• Diversifying source of revenue
  ○ Heavily relied on POSCO for financial support and the government's aid increased
  ○ In the long run, the university has to secure additional resources for the planned change. It may face, however, some difficulty of gaining sufficient fund because of the limited pool of alumni and the history of POSCO's exclusive support to the university

• Leadership for change and innovation
  ○ An internally selected president with short-term leadership (typically 4 years) may not be able to undergo a needed transformation for university development
Growing into a world-class university

Competent human resources:
Students, Faculty, Staff, researchers

Financial resources:
private and public research grants, endowment, national grants

Supportive environment:
strategic vision, institutional autonomy, advanced infrastructure

Possible barriers to the WCU status

• Organizational traps
  ○ Ambiguity of success
    • Institutional success are difficult to define and measure
  ○ Competency trap
    • Diminishing motivation to experimenting with new ideas

• Lack of institutionalizing “intellectual failure”
  ○ Fear of failure and risk-avoiding (globalization, change and innovations, independence from POSCO etc.)
Thank You

- **Contact information**
  - Byung S. Rhee ([beyoung@yonsei.ac.kr](mailto:beyoung@yonsei.ac.kr))