Riding the Globalization Wave: EPFL’s Strategy and Achievements

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Overview

1. The global context
2. Challenges for higher education
3. EPFL’s strategy and achievements
4. Conclusions
The knowledge economy

« In 2006, the world has produced more transistors than grains of rice » Samuel Palmisano, Chairman & CEO of IBM

Welcome to the knowledge economy where the human capital is an essential element of competitiveness

Scientific impact on economic activity

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<tr>
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<tbody>
<tr>
<td>Switzerland</td>
<td>1.70</td>
<td>1.59</td>
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<tr>
<td>United States</td>
<td>1.48</td>
<td>1.41</td>
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<tr>
<td>Denmark</td>
<td>1.48</td>
<td>1.33</td>
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<tr>
<td>United Kingdom</td>
<td>1.39</td>
<td>1.21</td>
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<tr>
<td>Netherlands</td>
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<td>1.33</td>
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<tr>
<td>Germany</td>
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<td>1.15</td>
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<tr>
<td>Austria</td>
<td>1.24</td>
<td>1.09</td>
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<tr>
<td>Belgium</td>
<td>1.21</td>
<td>1.17</td>
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<td>Sweden</td>
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<td>1.25</td>
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<tr>
<td>Canada</td>
<td>1.18</td>
<td>1.13</td>
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Source: Nature 430, 311 - 316 (15 July 2004)
Globalisation of educational services

- Implementation of Bologna process affects EHEA and RoW!

**Student mobility flows across “Bologna” countries**

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**The academic landscape in Europe**

- Globalisation of educational services
- Implementation of Bologna process affects EHEA and RoW!

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**The academic landscape**

- Demographic challenges ahead:
  - 2,400,000 students study abroad every year, but estimated growth of demand for international education: 6%
  - Projected drastic decrease of the 20-24 age cohort in developed countries (-10% in top-20 economies)
  - Growth mostly from developing and emerging countries

- Students mobility
- Faculty “star system”
- Off-shore campuses
- Newcomers

End of national monopolies
Diversity in educational structures

Structure of graduate education across "Bologna" countries

- Need for US style graduate schools?

Key issues to be addressed

- Appropriate management structure and corporate culture
- Attract and retain first rate Faculty
- Develop structured graduate education
- Recruit the best students (financial aid system?)
- Reinforce tech transfer
- Provide a modern infrastructure and attractive facilities
- Develop strategic partnerships
- Become less dependent on state funding
Major reorganizations since 2000

EPFL in numbers

6'746 Students (of which 1'624 PhD)
266 Professors
2140 Employees

Confederation Budget 554 Million CHF (2008)
External Financing 194 Million CHF (2008)
Total Budget 748 Million CHF or ≈ 500 Million EUR
Expenditure by source of funding (2008)

- **Federal**: 74%
- **CTI**: 2%
- **Public & private Sector**: 11%
- **EU**: 6%
- **FNRS**: 6%

**Diversity of 3rd party funds**

Expenses (Million CHF)

- **Industry**: 6%
- **Public & private sector**: 11%
- **EU**: 6%
- **CTI**: 2%
- **FNRS**: 6%

**EPFL’s Management structure**

- **VP-ACADEMIC AFFAIRS**
- **VP-INSTITUTIONAL AFFAIRS**
- **VP-INNOVATION & VALORISATION**
- **VP-PLANNING & LOGISTICS**

**Some Major Achievements**
A Bologna-based curriculum recognized world-wide

National and international accreditation

Anchor education in cutting-edge research

<table>
<thead>
<tr>
<th>Schools</th>
<th>Education programs</th>
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<tr>
<td>Basic Sciences</td>
<td></td>
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<tr>
<td>Engineering</td>
<td></td>
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<tr>
<td>Computer and Communication Sciences</td>
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<tr>
<td>Architecture, Civil and Environmental Eng.</td>
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<tr>
<td>Life Sciences</td>
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<tr>
<td>Social Sciences and Humanities</td>
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<tr>
<td>Management of Technology</td>
<td></td>
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</tbody>
</table>

Physics
Chemistry / Chemical Eng.
Mathematics
Material Sciences
Electrical Engineering
Microtechnology
Mechanical Engineering
Computer science
Communication systems
Architecture
Civil Engineering
Environmental Science & Eng.
Life Sciences & Technology
Management of Technology
Financial Engineering
Nuclear Engineering
Doctoral school: Launched in 2003

- 19 programs
- Guarantee the highest quality standards for recruitment
- Provide support and supervision to PhD students
- Create a network of PhD students throughout EPFL

Steady increase of PhD students

2008: 1'624 of which 65% international students

Evolution of student mix
Number of students

*CMS and postgraduate students not included
"A University is its Faculty"

- Recruit at the international level
- Give autonomy (an Assistant Professor is like a Full Professor!)
- Provide a stimulating environment and adequate resources
- Mentoring
- An evaluation process after 6-8 years

An attractive tenure track system

EPFL Faculty members by nationality

% of the total

- Switzerland
- France, Germany, Italy
- Europe, others
- North America
- Asia

EPFL Professors by nationality in % of the total

- 2000 (total: 143)
- 2004 (total: 221)
- 2008 (total: 266)

PATT Full Professors

- 2000
- 2008

Resources

- 0
- 100
- 200
- 300
Stimulate transdisciplinarity

Alinghi
Center for Biotechnology
Hydroptère
Center for Integrated Systems
Blue Brain
Solar Impulse
Montreux Jazz Festival archives
Center for Neuroprosthetics
Swisscube
Space Center
Design Center

Steady increase in publications

Excellence in Research
Bibliometrics
### ERC Advanced Grants in 2008

<table>
<thead>
<tr>
<th>Institution</th>
<th>Rank</th>
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<tbody>
<tr>
<td>EPFL (CH)</td>
<td>11</td>
</tr>
<tr>
<td>Weizmann Institute of Science (Israel, IL)</td>
<td>8</td>
</tr>
<tr>
<td>ETH Zürich (CH)</td>
<td>7</td>
</tr>
<tr>
<td>University of Oxford (UK)</td>
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<tr>
<td>Imperial College London (UK)</td>
<td>6</td>
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<tr>
<td>University of Cambridge (UK)</td>
<td>5</td>
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<tr>
<td>Université Catholique de Louvain (BE)</td>
<td>4</td>
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<tr>
<td>Université de Genève (CH)</td>
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<tr>
<td>Helsinki University of Technology (FI)</td>
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<tr>
<td>University College of London (UK)</td>
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### Shanghai Jiao Tong ARWU 2009 
**Engineering, Technology and Computer Science**

<table>
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<th>Institution</th>
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<tbody>
<tr>
<td>Massachusetts Inst Tech (MIT)</td>
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<tr>
<td>Stanford Univ</td>
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<tr>
<td>Univ Illinois - Urbana Champaign</td>
<td>3</td>
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<tr>
<td>Univ California - Berkeley</td>
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<tr>
<td>Carnegie Mellon Univ</td>
<td>5</td>
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<tr>
<td>Univ Michigan - Ann Arbor</td>
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<tr>
<td>Univ Texas - Austin</td>
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<tr>
<td>Georgia Inst Tech</td>
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<tr>
<td>Univ California - San Diego</td>
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<tr>
<td>Penn State Univ - Univ Park</td>
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<tr>
<td>Univ Southern California</td>
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<td>California Inst Tech</td>
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<td>Univ California - Santa Barbara</td>
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<td>Univ Maryland - Coll Park</td>
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<td>EPFL</td>
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<td>Univ Cambridge</td>
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<td>Purdue Univ - West Lafayette</td>
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<td>Cornell Univ</td>
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<td>University of Toronto</td>
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<tr>
<td>Tohoku Univ</td>
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### Competing in the premier league

EPFL is among the top universities globally, ranking highly in engineering, technology, and computer science. This reflects its commitment to excellence in research and competitiveness.

### A place to innovate

EPFL offers a Science Park with 100 companies, a College of Management of Technology, Tech transfer services, an Innovation network, an Entrepreneurship program, and Coaching. 12 new companies are established yearly.

**Innovate & Transfer**: Stimulate and support.

**Science Park with 100 companies**

**College of management of technology**

**Tech transfer services**

**Innovation network**

**Entrepreneurship program**

**Coaching**
A nice progression

Infrastructure: Main projects

Innovation Square
Conclusions

Competition for minds & funds beyond regional level
EPFL’s recipe:

- Clear positioning and action plan
- Quality of people at key managerial positions
- Competitive recruitment of Senior & Junior faculty
- Tools for academic cross-fertilization (education and research)
- Reduced dependency on state funding