A Reassessment of Asian Excellence Programs in Higher Education – the Taiwan Experience

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Three Major Concerns for Development of Higher Education in Global Times

• Building World Class University as one of the major aims of Excellence Initiatives in Asian Nations, including China, South Korea, Japan, Taiwan
• Enhancing a university’s volume of research papers, international collaborations and exchanges
• Major purpose of the paper
  – Comparing the goals, funding policy and selection criteria of the excellence programs in Asian nations
  – Analyzing the academic achievement of the top ranked universities in three areas: research output, internationalization, and excellence from Shanghai Jiao Tong, QS, and HEEACT rankings.
  – Taiwan as a case study
Outline of Presentation

• Development of Excellence Programs in the Asia Pacific region
  – Excellence Programs in China, Japan, South Korea, and Taiwan
  – Academic performance of Asian institutions in global rankings in terms of relation between input and output indicators
• Reassessment of an Excellence Program — the Taiwan Experience
  – Academic assessment
  – Meta Evaluation
  – Discussion

Excellence Programs in China, Japan, South Korea, and Taiwan

• Learning from the Western experience, China, Taiwan, Japan and South Korea started in the 1990s to develop so-called “Excellence” programs which involve allocating resources to a small number of universities to enhance their research power and their attractiveness to top students on the world stage.
• Chinese 985 initiative
• BK21 in Korea
• Taiwan’ “5 year -50 Billion Excellence Initiative” in Taiwan
• Global 30 scheme in Japan.
Comparison of Excellence Programs among China, South Korea, Japan and Taiwan

<table>
<thead>
<tr>
<th></th>
<th>China’s 985</th>
<th>Korean Brain 21</th>
<th>Japanese Global 30 (COE)</th>
<th>Taiwan 5 year 50 Billion</th>
</tr>
</thead>
</table>
| **Starting year**      | Phase one: 1998~2003  
Phase two: 2006~2012 (7 years) | Phase one (COE): 2002~2007  
Phase two: 2008~2012 | Phase one Five-year 50 Billion Program: 2006~2010  
Phase two (Moving into Top Universities Program): 2011~2015 |
| **Goal and mission**   | Developing 10 Chinese universities to global rankings | Cultivate global leaders | Recruiting 300,000 international students | Developing at least one university as one of the world’s top 100 universities in five years and 10 fields or research centers as “world class” |
| **Focus**              | Research / international reputation | Ph.D. programs/future leaders | Internationalization/economy | Research / international reputation |
| **Number of recipients** | 39 to 49 universities | 67 universities | 19 to 30 universities | 11~12 universities |
| **Total funding**      | US $ 5 billion | US $ 3.5 billion | US $ 2.5 billion | US $ 0.66 billion |

Two Observation from Yale University President Richard C. Levin

- all Asian nations understand the importance of university-based scientific research in driving economic growth
- They expect to “educate graduates for careers in science, industry, government, and civil society who have the intellectual breadth and critical-thinking skills to solve problems, to innovate, and to lead”
Academic performance of Asian institutions in global rankings

- Global rankings developed in the early 21st century
- Asia was the main area of the world in which they found acceptance and became important.
  - rankings are a simple way for universities to see their own progress at a time
  - Asia needs a stronger university system to support its ambitions.
  - Japan, China, Korea and Taiwan, which all had Excellence Programs, indeed had a better performance than other Asian nations

Table 2: Average Number of top 500 Universities of Japan, China, South Korea and Taiwan by three rankings

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>33.3</td>
<td>31</td>
<td>29.5</td>
<td>31.3</td>
</tr>
<tr>
<td>China</td>
<td>12</td>
<td>13.3</td>
<td>11.5</td>
<td>12.3</td>
</tr>
<tr>
<td>South Korea</td>
<td>8.5</td>
<td>9</td>
<td>11.5</td>
<td>9.7</td>
</tr>
<tr>
<td>Taiwan</td>
<td>5.6</td>
<td>5.3</td>
<td>8.5</td>
<td>6.5</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>5</td>
<td>5</td>
<td>5.5</td>
<td>5.2</td>
</tr>
<tr>
<td>India</td>
<td>2.1</td>
<td>2</td>
<td>8.8</td>
<td>4.3</td>
</tr>
</tbody>
</table>
Assessment of academic output among the institutions in four nations

- Number of the paper published on SCI and SSCI journals
- Average citations in five years
- Number of international students

Figure 1: The number of the paper published on SCI and SSCI journals in China, Taiwan, Japan, South Korea
Figure 3: Number of papers in Nature & Science in five years in China, Taiwan, Japan, South Korea

Figure 5: Number of international students in China, Taiwan, Japan, South Korea
Examining relations between the funding and output indicators

- With more funding, China indeed has more output in papers, internationalization and excellence, South Korea follows after.
- The more the nations had put into these efforts, the more output and outcomes they will gain.

Figure 6: The relationship between funding and research output in China, Taiwan Japan, South Korea by increase rate
Figure 7: The relationship between funding and internationalization and excellence in China, Taiwan, Japan, South Korea by increase rate.

Short Summary

- China – paper publication
- Taiwan – paper citation
- South Korea – international students
- Japan – Nobel prize winning
Fact Sheet in Taiwan Higher Education

1. Number of universities and colleges
   Increased by 120% in the past 10 years with more than 163 institutions
   (1/3 national U; 2/3 private U)

2. Student enrollment
   With a total number of 1.3 millions increased 65% with a number of 33751
   Ph.D students, 183401 graduate students, 1 million
   undergraduates

3. University Entrance Exam admission rate
   More than 98% in 2010

4. Net enrollment in higher education/ Gross enrollment
   55.3% (total number of 18-22 year-old students studying at a
   university and a college / school-aged population between 18-21 years
   old)

5. Gross enrollment rate increased
   78.6% (total number of students studying at a university and a college /
   school-aged population between 18-21 years old)

6. Tuition
   1800 USD for National universities / 3300 for Private universities

7. GDP average 17,697 USD

8. Population 23 million

9. Area 36,191 Km2

10. Friendly people

11. IT industry

12. Food and Chinese Culture
Taiwan has Many “Top One” in the World

<table>
<thead>
<tr>
<th>Industry/Products</th>
<th>Share % in the global market</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notebook</td>
<td>90%</td>
</tr>
<tr>
<td>CD-ROM drive</td>
<td>30%</td>
</tr>
<tr>
<td>Motherboard</td>
<td>79%</td>
</tr>
<tr>
<td>Monitor</td>
<td>65%</td>
</tr>
<tr>
<td>CD copier</td>
<td>79%</td>
</tr>
<tr>
<td>Foundry</td>
<td>68.5%</td>
</tr>
<tr>
<td>IC Package</td>
<td>48%</td>
</tr>
<tr>
<td>Testing Industry</td>
<td>65.2%</td>
</tr>
<tr>
<td>Mask-ROM</td>
<td>98.7%</td>
</tr>
<tr>
<td>Thin computer</td>
<td>99%</td>
</tr>
</tbody>
</table>

Background of Taiwan’s Excellence Program

- In response to the quest for an excellent university and as one of "Ten New Major National Projects", the Taiwan government launched the five-year 50 Billion Program for Developing First-class University and Top Research Centers in 2006 and the second round started in 2011.
- The selected universities were given flexible governance over the use of the grants by block-funding policy.
### Table 3 MOE grants Taiwan’s Universities received from 2006 to 2011 (USD in million)

<table>
<thead>
<tr>
<th>Institutions</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>Total 5-year funding</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Taiwan University</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>500</td>
<td>103.3</td>
</tr>
<tr>
<td>National Cheng Kung University</td>
<td>56.7</td>
<td>56.7</td>
<td>56.7</td>
<td>56.7</td>
<td>56.7</td>
<td>283.5</td>
<td>17%</td>
</tr>
<tr>
<td>National Tsing Hua University</td>
<td>33.3</td>
<td>33.3</td>
<td>40.0</td>
<td>40.0</td>
<td>40.0</td>
<td>186.6</td>
<td>11.2%</td>
</tr>
<tr>
<td>National Chiao Tung University</td>
<td>26.7</td>
<td>26.7</td>
<td>30.0</td>
<td>30.0</td>
<td>30.0</td>
<td>143.4</td>
<td>8.6%</td>
</tr>
<tr>
<td>National Central University</td>
<td>20.0</td>
<td>20.0</td>
<td>23.3</td>
<td>23.3</td>
<td>23.3</td>
<td>109.9</td>
<td>6.6%</td>
</tr>
<tr>
<td>National Sun Yat-sen University</td>
<td>20.0</td>
<td>20.0</td>
<td>20.0</td>
<td>20.0</td>
<td>20.0</td>
<td>100</td>
<td>6%</td>
</tr>
<tr>
<td>National Yang Ming University</td>
<td>18.7</td>
<td>18.7</td>
<td>16.7</td>
<td>16.7</td>
<td>16.7</td>
<td>83.5</td>
<td>5%</td>
</tr>
<tr>
<td>National Chung Hsing University</td>
<td>13.3</td>
<td>13.3</td>
<td>15.0</td>
<td>15.0</td>
<td>15.0</td>
<td>71.6</td>
<td>4.3%</td>
</tr>
</tbody>
</table>

### Academic performance by increase rate

- **Research outputs**
  - the number of SCI papers increased by 49%
  - SSCI papers by 172%.
  - highly cited papers by 129%
- **Internationalization**
  - Number of international students by 79%
  - Number of international scholars by 700%
- **University and Industry collaboration**
  - Funding generating from industry-university collaborations by 28%
Meta Assessment on the Taiwan’s Excellence Program

- A survey targeting on 138 top administrators from 11 universities and 30 reviewers was also conducted in 2011
- Categories on goal, mission, criteria, outcomes, and its impacts on Taiwan higher education

1. Mission and goal

- Agree highly on
  - enhancing internationalization and excellence of Taiwan’s higher education
  - improving the infrastructure of universities, cultivating top talent
  - increasing the volume and quality of publications are appropriate
- Agree least on
  - Outcomes of global rankings,
  - criteria such as “At least one university ranked top 100 in ARWU, QS and HEEACT global rankings within 10 years”, “At least one university ranked top 50 in ARWU, QS and HEEACT global rankings within 15-20 years”, “At least ten fields or research centers ranked top in Asia in ARWU, QS and HEEACT global rankings within 5 years”
2. Review criteria and process

- Agreed that recipients should be reviewed in terms of teaching as well as research
- Majority of institutional respondents questioned the professionalism and qualifications of review panels and criticized aspects of the audit system – such as "submission of mid reports every three months", "number of on-site visits by external reviewers", and “no flexibility for funding allocation and accounting system”

3. Impact on higher education

- Agreed highly that “the program assisted recipients to enhance international visibility”, “developing academic features”, “improving their ranks in global ranking”
- 86% of institutional respondents thought grant recipients “carried out social responsibility and shared the public with academic output”, comparing to 72% of reviewers
Two major concerns

- Public concerns over goal achievement and teaching quality
  - The 11 universities have been expected to not only increase their research but also to improve teaching quality
  - non-recipients were worried that very research-oriented indicators might be adopted as the only criteria in the selection process for the second stage of the Excellence Program in 2011
- Rankings or not Rankings
  - Methodological flaw
  - Most respondents disagreed on rankings
  - Global ranking might likely marginalize teaching-type institutions

Some international advice

- there could be a “mini” excellence initiative to help the smaller HEIs or private institutions (by John Hawkins)
- there could be a “mini” excellence initiative to help the smaller HEIs or private institutions (by Jamil Salmi)
- only a few schools will have a chance to become excellent (Robert Morse)
Conclusion

• “Competitiveness” and “concentrated investment” are two principles for higher education policy making in Asia.
• More the nations had, the more output and outcomes they will gain, like China.
• Some challenges
  – the financial sustainability of these investments
  – the gap in quality and size
  – high ranking is regarded as a result of excellence, not as a surrogate for achievement

2012 IREG-6 in Taipei
6th Meeting of the International Rankings Expert Group
Academic Rankings and Advancement of Higher Education: Lessons from Asia and other Regions
18-22 April

Call for paper
1. Rise of Higher Education in Asia: Competition and Cooperation
2. Asian Experience in Ranking Development: Asian Governmental Policy
3. Asian Experience in Ranking Development: Institutional behavior towards academic rankings

Welcome you to come to Taipei!!
Thank you for your attention
Questions and Comments

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Fu Jen Catholic University