The National University of Singapore and University of Malaya: Common Roots, Different Paths

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Introduction

• Review of two universities: National University of Singapore (NUS); University of Malaya (UM)
  – Common origin
  – Post-independence missions
  – Secondary school preparation for students
  – Strategies for institutional management, nurturing students, academic staffing
  – Policies regarding internationalization of students and faculty
  – Inter-connections with global advances
Common Roots of NUS and UM

• 1949 merger between King Edward VII College of Medicine in Singapore (1905) → with Raffles College to become the University of Malaya (1949) located in Singapore
• 1957 – Malaysia won independence for British rule
• 1959 – Singapore won independence from British
• 1962 – Establishment of NUS and UM as separate entities
• Multiracial populations in Malaysia and Singapore

Mutiracial populations

<table>
<thead>
<tr>
<th></th>
<th>TOTAL</th>
<th>CHINESE</th>
<th>MALAY</th>
<th>INDIAN</th>
<th>OTHERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singapore</td>
<td>4.8 m</td>
<td>77%</td>
<td>14%</td>
<td>8%</td>
<td>1%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>28 m</td>
<td>26%</td>
<td>65%(bumi)</td>
<td>8%</td>
<td>1%</td>
</tr>
</tbody>
</table>
Preindependence function of higher education

- To produce graduates equipped to support colonial government at lower levels of administration
- Provide limited technical and professional services at low levels of expertise

Different Missions of NUS and UM

- Mission statements with different emphases
  - NUS priority: being on the cutting edge of teaching and research to keep pace with growing economy
    - English language continues as medium of instruction
  - UM – 1970s New Economic Policy
    - affirmative action designed to achieve national integration
    - eradicating poverty
    - restructuring Malaysian society to eliminate identification of race with economic function
Impact of NEP

- Successful in meeting policy of admitting lower income bracket students: around 60%
- Impressive record of upward mobility in single generation
- Affected student admission quotas
- Recruitment and promotion of academic staff
- Training opportunities

Led to
- Reduced overall talent pool at UM
- Reduced competition
- Unable to provide strategic innovations and production as Malaysia faced competition from countries such as China, South Korea and Taiwan

NUS and UM: Relationship Between University and State

- Both universities funded by government
- Functioned as government departments
- Generally bureaucratic work processes
UM: Relationship Between University and State

- **UM 1971 University and Colleges Act** prescriptive guidelines for university management
  - Reinforced bureaucratic work practices
  - Corporatization Act passed in 1997 but partially implemented since then
  - Legislative framework partially implemented
  - Insufficient independence until recently to influence student admissions/intake, and staffing among others
  - Unlike NUS, unable to offer competitive compensation packages to attract talent

Transformation Processes: NUS

- **Early realization of universities’ role in sustaining economic growth**
- **Early 1970s labor-intensive strategy to technology-intensive strategy**
  - early 1980s university admissions and strategic planning influenced by
  - Government policies related to high-level manpower requirements
  - Outcomes of monitoring market forces to reduce risks of graduate unemployment
  - Tight financial control of the budget by the Ministry
- **Organizational transformation started from late 1990s to better meet the challenge of global competition**
- **Accelerated since corporatization in 2006**
Transformation Processes: UM

- Inability to make autonomous academic, professional, financial and technical decisions retarded growth and international competitiveness
- Organizational structures expanded, but inadequate attention to management
- Recent internal reforms:
  - Internal realignment of policies and practices to fit with those of successful research universities
  - New performance targets for academic and research staff for all universities, focusing on developing a culture of scholarship and research, positive early results
  - Building transparency into administrative procedures in order to improve accountability and overall governance across the university

NUS and UM: Financing

- Singapore: Education 3% of GDP, university share of public education expenditure rose from 10.8% in 1962 to 19.8% in 2007
- Malaysia: 2.7% of GDP for Education, higher education receives about 24% of annual education budget
- Research allocations in NUS and UM:
  - Research expenditure in NUS more than tripled between 1997-2007. Bulk of the research spending in engineering and medicine
  - Government research funding in Malaysia now concentrated in four ‘research’ universities, including UM.
  - Instability and traditionally low levels of research funding in UM vs stable and growing resources for research in Singapore
Schooling and Preparedness for Tertiary Education

- **Malaysia and Singapore**: public schools follow centralized, common curriculum which lead to common examinations
- **Singapore**: International testimony to the pre-university education system successful performance in TIMSS (among 13-years olds, Singapore ranked within top three in Maths and Science in 1995, 2003, 2007).
  - School curriculum regularly reviewed and revised.
- **Malaysia**: Ranking in TIMSS has fallen from 1999-2007
  - Average score in eighth grade Maths declined from 519 to 474 (below average score of 500)
  - Average score for eighth grade science increased between 1999 (492) and 2003 (510) but fell in 2007 (471)
  - In 2007, Malaysia’s average scores in mathematics and science remained significantly behind those of Singapore and other East Asian NIEs.
  - Secondary education in national schools conducted in Malay
    - Exception is Maths and Science, but these will revert to being taught in Malay by 2012
  - Public education system has largely fostered memory-based learning and conformity rather than creative thinking (Nagaraj et al. 2009)

Schooling and Preparedness for Tertiary Education: Medium of Instruction

- **Singapore**: English used as a common language to connect citizens of all ethnic backgrounds, and tie Singapore to the world economy
  - Mother tongue instruction also available, along with French, German or Japanese
  - Free language education by the Ministry of Education Language Centre for most additional languages that schools do not cover
Schooling and Preparedness for Tertiary Education: Medium of Instruction

• **Malaysia**: Malay has been the medium of instruction at school and university since 1970s (postgrad courses in English available, also for undergrad in last 5 years)
  – Poses obstacles for university students in using texts and journals in English, preference for using lecture notes
  – English language proficiency becomes an issue with policies of internationalization of faculty and students

Student Admissions & Nurturing: NUS

• Students admission criteria and process
• Increasing proportion of undergraduates
• Student : teaching faculty ratios
• Student : teaching and research staff ratios
• Distribution of students by faculty
• Internationalization of student body
• Teaching and Learning
• International Exchange Programs
• Outcome of student programs on quality of learning experience
Student Admissions & Nurturing: UM

- Student admissions criteria and pathways
- Policy framework for admissions post-1970s and outcomes
- Teaching-Learning experiences, campus life
- Graduate enrollment policy and distribution of graduate students
- Student Exchange programs
- Internationalization of students and policy change
- Recent curriculum initiatives

Development of Academic Faculty: NUS

- Strategic goal - NUS as a globally competitive university
- Key policy instruments
  - compensation packages
  - research support
  - raising threshold for promotion and tenure
  - flexible time allocation
  - measuring improved faculty quality
- Internationalization of faculty and researchers
Development of Academic Faculty: UM

- Impact of Malayanization on staffing
- Impact of NEP on staffing
- Initiatives to improve staff quality
- New performance targets
- Internationalization of faculty and continuing policy

Development and Management of Research: NUS

- Increased investment in R&D infrastructure
- Establishment of technology licensing office (INTRO)
- Establishment of NUS Enterprise
Development and Management of Research: UM

- Research Policy and Challenge as in Ninth Malaysia Development Plan
- Strengthening research base in UM
- Establishing Institute of Research and Monitoring
- Issues of Support for Research

Performance Signposts and Indicators of Success

- Overall International Ranking
- SCI and SSCI-Indexed Papers and Citations
- Levels of Patenting
- International Reputation, Awards and Collaboration
Performance Signposts and Indicators of Success: Overall International Ranking

### Ranking of UM and NUS in the World University Rankings by the Times Higher Education Supplement, 2004-08

<table>
<thead>
<tr>
<th>Year</th>
<th>National University of Singapore</th>
<th>University of Malaya</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>Overall 18</td>
<td>Overall 89</td>
</tr>
<tr>
<td>2005</td>
<td>22</td>
<td>169</td>
</tr>
<tr>
<td>2006</td>
<td>19</td>
<td>192</td>
</tr>
<tr>
<td>2007</td>
<td>33</td>
<td>246</td>
</tr>
<tr>
<td>2008</td>
<td>30</td>
<td>230</td>
</tr>
</tbody>
</table>

For Biomedicine, Science, Technology, Social Sciences, and Arts and Humanities, the rankings are as follows:

<table>
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<th>University of Malaya</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>Overall 18</td>
<td>Overall 89</td>
</tr>
<tr>
<td>2005</td>
<td>Biomedicine 25</td>
<td>Biomedicine na</td>
</tr>
<tr>
<td>2006</td>
<td>Science 35</td>
<td>Science na</td>
</tr>
<tr>
<td>2007</td>
<td>Technology 9</td>
<td>Technology na</td>
</tr>
<tr>
<td>2008</td>
<td>Social Sciences 10</td>
<td>Social Sciences na</td>
</tr>
</tbody>
</table>


- **NUS ranked among (or close to) top 30 over 2004-2008; UM has declined from 89 in 2004 to 230 in 2008**
- **Gap between NUS and UM widest in the fields of science and technology**

### Performance Signposts and Indicators of Success: SCI and SSCI-indexed Papers and Citations

#### Publications and Citations of Selected Malaysian Universities vs other Leading Asian Universities, Jan 1999-Feb 2009

<table>
<thead>
<tr>
<th>Country</th>
<th>No. of Papers</th>
<th>No. of Citations</th>
<th>Citations Per Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universiti Sains Malaysia</td>
<td>Malaysia</td>
<td>3,250</td>
<td>13,257</td>
</tr>
<tr>
<td>Universiti Malaya</td>
<td>Malaysia</td>
<td>3,439</td>
<td>14,316</td>
</tr>
<tr>
<td>Universiti Kebangsaan Malaysia</td>
<td>Malaysia</td>
<td>1,528</td>
<td>5,624</td>
</tr>
<tr>
<td>Hong Kong Univ of Sci &amp; Tech</td>
<td>Hong Kong</td>
<td>10,402</td>
<td>96,281</td>
</tr>
<tr>
<td>University of Hong Kong</td>
<td>Hong Kong</td>
<td>18,700</td>
<td>187,339</td>
</tr>
<tr>
<td>Seoul National University</td>
<td>Korea</td>
<td>33,779</td>
<td>271,702</td>
</tr>
<tr>
<td>KAIST</td>
<td>Korea</td>
<td>15,166</td>
<td>102,086</td>
</tr>
<tr>
<td>National Taiwan University</td>
<td>Taiwan</td>
<td>27,255</td>
<td>196,631</td>
</tr>
<tr>
<td>Peking University</td>
<td>China</td>
<td>22,857</td>
<td>148,132</td>
</tr>
<tr>
<td>Tsinghua University</td>
<td>China</td>
<td>23,182</td>
<td>121,584</td>
</tr>
<tr>
<td>University of Tokyo</td>
<td>Japan</td>
<td>67,864</td>
<td>882,361</td>
</tr>
<tr>
<td>Kyoto University</td>
<td>Japan</td>
<td>49,657</td>
<td>618,383</td>
</tr>
<tr>
<td>National University of Singapore</td>
<td>Singapore</td>
<td>28,602</td>
<td>236,388</td>
</tr>
</tbody>
</table>

Source: Wong and Ho (forthcoming), compiled from Thomson ISI's Essential Science Indicators

- **Significant gap between research output of UM and other Malaysian research universities vs leading Asian universities**
  - Both in terms of quantity (no. of publications) and quality (citations per paper, citations per faculty)
Performance Signposts and Indicators of Success: SCI and SSCI-indexed Papers and Citations (contd)

<table>
<thead>
<tr>
<th>Publications &amp; Citations of UM and NUS, 1981-2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering fields</td>
</tr>
<tr>
<td>UM</td>
</tr>
<tr>
<td>No. of papers</td>
</tr>
<tr>
<td>1981-83</td>
</tr>
<tr>
<td>1991-93</td>
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<tr>
<td>2001-03</td>
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<tr>
<td>Average citation rate per publication</td>
</tr>
<tr>
<td>1981-83</td>
</tr>
<tr>
<td>1991-93</td>
</tr>
<tr>
<td>2001-03</td>
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</tbody>
</table>

Source: calculated from Web of Science
Note: SCI- and SSCI-indexed journals only
The citation rate is calculated in the following manner: The number of citations within 5 years of publication were collated (eg the number of citations made in 1981-1986 are collated for papers published in 1981, etc). The total number of publications and citations for each of the three time periods (1981-83, 1991-93 and 2001-03) are then pooled, and based on this, the average citation rate per publication rate is calculated

- UM has fallen behind NUS in quantity and quality of international-refereed publications
- UM has developed strategies to improve academic culture, requirements based on ISI publications

Performance Signposts and Indicators of Success: Levels of Patenting

<table>
<thead>
<tr>
<th>Publications &amp; Citations of UM and NUS, 1981-2003</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>1990-94</td>
</tr>
<tr>
<td>1995-99</td>
</tr>
<tr>
<td>2000-04</td>
</tr>
<tr>
<td>2005-08</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Note: NUS patents include those which are jointly assigned to other parties
Source: Wong, Ho and Singh, 2009

- NUS has significantly increased patenting output since 2000; negligible patenting output from UM since 1990
- Low level of patenting by Malaysian universities
  - Outcome of government policy focus on basic research (Cheng 2009) vs
  - Quality and strategic focus of research (research in the “Pasteur quadrant”)
Performance Signposts and Indicators of Success: International Reputation, Recognition, Awards and Collaboration

- **International recognition of NUS:**
  - LKY School of Public Policy became 1st institution outside of Europe and North America to join Public Policy Network (2007)
  - NUS President awarded the Chief Executive Leadership Award by the Council for Advancement and Support of Education (CASE) (2007)
  - NUS became a founding member of the International Alliance of Research Universities (IARU) (2006)
  - Singapore-MIT Alliance (SMA) Program, developed into a joint degree program
  - At the faculty level, increasing number of joint degree programs established between NUS and other leading universities (e.g. Peking University, UCLA) testifies to the growing standing of NUS in the international academic community.

Performance Signposts and Indicators of Success: International Reputation, Recognition, Awards and Collaboration (contd.)

- **Malaysia’s participation and performance in international academic activities has been intermittent, more dependent on individual staff than on university practice**
  - Discernible change over the last five years, generally linked by general public to collective response to world university rankings
  - UM has participated in the International Exhibition of Inventors, Techniques and Products (ITEX) in Geneva. Won 19 gold medal awards in 2005, 32 awards in 2009
  - Won 4 gold medals at the Seoul International Fair (2006)
  - Surgeon at UM’s Medical Faculty won International Union Against Cancer 2009 Reach to Recovery International Health Professional Award in Australia, only non-Australian recipient to receive the award (2009)
  - Gastrointestinal Endoscopy Unit of Medical Faculty was designated one of 16 centers of excellence in the world by World Organization of Digestive Endoscopy (2008)
  - Continuing work to receive international accreditation for programs
Comparison of NUS and UM: Some lessons Learned

• **Sustained strategic thinking about national development and economic growth can become a driver for academic excellence**
  – Can enable a university from an NIE to rapidly ascend into the league of leading global universities

• **National-level policies can severely constrain the institutional development of a public university**
  – Can have significant long-term consequences in terms of limiting its capacity and culture to pursue academic excellence and to compete internationally
  – Changing institutions’ mission and priorities is a challenge, affecting deep-rooted working principles, regulations, and financial management systems,
  – The transformation of a university to match a new vision and new targets is a courageous endeavor
  – Requires strong political will to stay the course over the long term