

# The Challenge of Establishing World-Class Universities

Jamil Salmi<sup>1</sup>

“I do believe that it is necessary to stress that for most countries today, human resource development and human capital formation are either extremely important, absolutely vital, or a matter of life and death. In the case of Malaysia...we think it is a matter of life or death.”

Abdullah Bin Ahmed Badawi, Prime Minister of Malaysia (Opening Speech of the 2006 Meeting of the Association of Commonwealth Universities)

## 1. Introduction

In September 2005, the new world ranking published by the *Times Higher Education Supplement* was received like a bomb shell in Malaysia when it showed the country's top two universities slipping by almost 100 places compared to the previous year. Notwithstanding the fact that the big drop was mostly due to a change in the ranking methodology, the news was so traumatic that there were widespread calls for the establishment of a Royal Commission of Inquiry to investigate the matter. This strong reaction was not out of character in a nation whose current Ninth Development Plan aims at shaping the transformation of the country into a knowledge-based economy with emphasis on the important contribution of the university sector.

Preoccupations about university rankings reflect the general recognition that economic growth and global competitiveness are increasingly driven by knowledge, and that universities can play a key role in that context. Indeed, rapid advances in science and technology across a wide range of areas from information and communication technologies (ICTs) to biotechnology to new materials provide great potential for countries to accelerate and strengthen their economic development. The application of knowledge results in more efficient ways of producing goods and services and delivering them more effectively and at lower costs to a greater number of people.

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<sup>1</sup> Jamil Salmi is the Tertiary Education Coordinator of the World Bank. The findings, interpretations, and conclusions expressed in this article are entirely those of the author and should not be attributed in any manner to the World Bank, the members of its Board of Executive Directors or the countries they represent. The author wishes to express his gratitude to Roberta Bassett for her excellent research assistance. The author would also like to thank all the colleagues who kindly reviewed earlier drafts and offered invaluable suggestions, in particular Vladimir Briller, Marguerite Clarke, Richard Hopper, Isak Froumin, Nadia Kulikova, Sam Mikhail, William Saint and Alenoush Saroyan. Full responsibility for errors and misinterpretations remains, however, with the author.

The 1999 World Development Report on the Knowledge Economy (World Bank, 1999) proposed an analytical framework emphasizing the complementary role of four key strategic dimensions to guide countries in the transition to a knowledge-based economy: an appropriate economic and institutional regime, a strong human capital base, a dynamic information infrastructure and an efficient national innovation system.

Tertiary education is central to all four pillars of this framework, but its role is particularly crucial in support of building a strong human capital base and contributing to an efficient national innovation system. Tertiary education helps countries build globally competitive economies by developing a skilled, productive and flexible labor force and by creating, applying and spreading new ideas and technologies. A recent global study of patent generation has shown, for example, that universities and research institutes, rather than firms, drive scientific advances in biotechnology (Cookson, 2007). Tertiary education institutions can also play a vital role in their local and regional economy (Yusuf and Nabeshima, 2007).

Within the tertiary education system, research universities play a critical role in training the professionals, scientists and researchers needed by the economy and generating new knowledge in support of the national innovation system (World Bank, 2002). In this context, an increasingly pressing priority of many governments is to make sure that their top universities are actually operating at the cutting edge of intellectual and scientific development.

The main objective of this paper, therefore, is to explore what are the challenges involved in setting up globally competitive universities, also called “world-class”, “elite”, or “flagship” universities, that will be expected to compete effectively with the best of the best. The paper starts by attempting to construct an operational definition of a world-class university. It then outlines possible strategies and pathways for establishing such universities.

## **2. What does it mean to be a world-class university?**

In the past decade, the term “world-class university” has become a catch phrase for not simply improving the quality of learning and research in tertiary education but more importantly for developing the capacity to compete in the global tertiary education marketplace through the acquisition and creation of advanced knowledge. With students looking to attend the best possible institution they can afford, often regardless of national borders, and governments keen on maximizing the returns on their investments on universities, global standing is becoming an increasingly important concern for institutions around the world (Williams and Van Dyke, 2007). The paradox of the world-class university, however, as Altbach has succinctly and accurately observed, is that “everyone wants one, no one knows what it is, and no one knows how to get one” (Altbach, 2004).

To become a member of the exclusive group of world-class university is not something that one achieves by self-declaration. This is an elite status conferred by the outside

world on the basis of international recognition. Until recently, the process involved a subjective qualification based mostly on reputation. For example, Ivy League universities in the United States, such as Harvard, Yale or Cornell, Oxford and Cambridge in the United Kingdom, and Tokyo University have traditionally been counted among the exclusive group of elite universities. But no direct and rigorous measure was available to substantiate their superior status in terms of training of graduates, research output, and technology transfer. Even the higher salaries captured by their graduates could be interpreted as a signaling proxy as much as the true value of their education.

With the proliferation of league tables in the past few years, however, more systematic ways of identifying and classifying world-class universities have appeared (IHEP, 2007). While most of the 45 of the best known rankings purport to categorize universities within a given country, there have also been attempts to establish international rankings. The two most comprehensive international rankings, allowing for broad benchmark comparisons of institutions across national borders, are those prepared by the Times Higher Education Supplement (THES) and Shanghai's Jiao Tong University (SJTU).

To compare the international stature of institutions, these league tables are constructed by using objective and/or subjective data obtained from the universities themselves or from the public domain. The THES ranking selects the top 200 universities in the world. First presented in 2004, the methodology for this ranking focuses most heavily on international reputation, combining subjective inputs such as peer reviews and employer recruiting surveys and quantitative data, including the numbers of international students and faculty, and the influence of the faculty, as represented by research citations. Operating since 2003, SJTU uses a methodology that focuses on seemingly more objective indicators, such as the academic and research performance of faculty, alumni, and staff. The measures evaluated include publications, citations, and exclusive international awards, such as Nobel prizes and Fields medals. Shanghai's ranking is also presented slightly differently: the top 100 institutions are listed in ranked ordinal. The remaining 400 institutions are listed by clusters of approximately 50 and 100 (101-152, 153-202, 203-300, etc.), and alphabetically within those clusters. Table 1 shows the results of the 2006 world rankings.

**Table 1 - Top Twenty Universities in World Rankings  
(2006)**

<b>Rank</b>	<b>THES</b>	<b>Rank</b>	<b>SJTU</b>
1	Harvard University	1	Harvard University
2	University of Cambridge	2	University of Cambridge
3	University of Oxford	3	Stanford University
4	Massachusetts Institute of Technology	4	University of California - Berkeley
4	Yale University	5	Massachusetts Institute of Technology
6	Stanford University	6	California Institute of Technology
7	California Institute of Technology	7	Columbia University
8	University of California, Berkeley	8	Princeton University
9	Imperial College London	9	University of Chicago
10	Princeton University	10	University of Oxford
11	University of Chicago	11	Yale University
12	Columbia University	12	Cornell University
13	Duke University	13	University of California - San Diego
14	Beijing University	14	University of California - Los Angeles
15	Cornell University	15	University of Pennsylvania
16	Australian National University	16	University of Wisconsin - Madison
17	London School of Economics and Political Science	17	University of Washington - Seattle
18	Ecole Normale Supérieure (Paris)	18	University of California – San Francisco
19	National University of Singapore	19	Johns Hopkins University
19	Tokyo University	20	Tokyo University

Notwithstanding the serious methodological limitations of any ranking exercise (Salmi and Saroyan, 2007), world-class universities are recognized in part for their superior outputs. They produce well-qualified graduates who are in high demand on the labor market, they conduct leading-edge research published in top scientific journals and, in the case of science and technology oriented institutions, they contribute to technical innovations through patents and licenses.

As illustrated by Table 1, most universities recognized as world-class originate from a very small number of countries, mostly Western. In fact, Tokyo University is the only non US and non UK university among the top 20 in the SJTU ranking. If one considers that there are between 30 and 50 world-class universities in total, according to the SJTU ranking they all come from a small group of 8 North American and Western European countries, Japan being again the only exception (see Annex 1). THES has a slightly wider range of countries of origin among the top 50 universities (11 countries), including Singapore, Hong Kong and New Zealand besides the usual North American and Western European nations (see Annex 2).

The few scholars who have attempted to define what world-class universities have that regular universities do not possess have identified a number of basic features such as highly qualified faculty, excellence in research, quality teaching, high levels of government as well as non-government sources of funding, international and highly talented students, academic freedom, well-defined autonomous governance structures, and well-equipped facilities for teaching, research, administration, and, often, student life (Altbach, 2004; Khoo, 2005; Niland, 2000, 2007). Recent collaborative research on this theme between UK and Chinese universities (Alden and Lin, 2004) has resulted in an even longer list of key attributes, ranging from the international reputation of the university to more abstract concepts, such as the university's contribution to society, both very difficult to measure in an objective manner (see Annex 3).

In an attempt to propose a more manageable definition of world-class universities, this policy note makes the case that the superior results of these institutions (highly sought graduates, leading edge research, technology transfer) can essentially be attributed to three complementary sets of factors that can be found at play among most top universities, namely (i) a **high concentration of talent** (faculty and students), (ii) **abundant resources** to offer a rich learning environment and conduct advanced research, and (iii) **favorable governance** features that encourage strategic vision, innovation and flexibility, and enable institutions to make decisions and manage resources without being encumbered by bureaucracy.

2.1 Concentration of Talent. The first and perhaps foremost determinant of excellence is the presence of a critical mass of top students and outstanding faculty. World-class universities are able to select the best students and attract the most qualified professors and researchers.

In the sciences, being at the right university—the one where the most state-of-the-art research is being done in the best equipped labs by the most visible scientists—is extremely important. George Stigler describes this as a snowballing process, where an outstanding scientist gets funded to do exciting research, attracts other faculty, then the best students—until a critical mass is formed that has an irresistible appeal to any young person entering the field.

Mihaly Csikszentmihalyi (Flow and the Psychology of Discovery and Invention)

This has always been the hallmark of Ivy League universities in the US or Oxford and Cambridge in the UK. And it is also a feature of the newer world-class universities, such as the National University of Singapore or Tsing Hua University in China.

An important factor in that respect is the ability and the privilege of these universities to select the most academically qualified students. For example, Beijing University, China's top institution of higher learning, admits the 50 best students of each province every year. Harvard University, the California Institute of Technology, MIT and Yale University are the most selective universities in the United States as measured by the average SAT scores of their incoming undergraduate students.

One corollary of this observation is that tertiary education institutions in countries where there is little internal mobility of students and faculty are at risk of academic in-breeding. Indeed, universities that rely principally on their own undergraduates to continue into graduate programs or that hire many of their own graduates to join the teaching staff are not likely to be at the leading edge of intellectual development.

It is also difficult to maintain high selectivity in institutions with rapidly growing student enrollment and fairly open admission policies. The huge size of the leading universities of Latin American countries such as México or Argentina—the Autonomous University of México (UNAM) has 137,000 students and the University of Buenos Aires (UAB) has 183,000—is certainly a major factor in explaining why these universities have failed to enter the top league, despite having a few excellent departments and research centers which are undoubtedly world-class. At the other extreme, Beijing University maintained its overall enrollment at less than 20,000 until the early 2000s and even today has no more than 30,000 students.

World-class universities also tend to have a high proportion of carefully selected graduate students, as illustrated by Table 2 below, reflecting their strength in research.

**Table 2 – Weight of Graduate Students in Selected Universities**

University	Undergraduate Students	Graduate Students	Share of Graduate Students (%)
Harvard <sup>1</sup>	7,002	10,094	59
Stanford <sup>2</sup>	6,442	11,325	64
MIT <sup>3</sup>	4,066	6,140	60
Oxford <sup>4</sup>	11,106	6,601	37
Cambridge <sup>5</sup>	12,284	6,649	35
LSE <sup>6</sup>	4,254	4,386	51
Beijing <sup>7</sup>	14,662	16,666	53
Tokyo <sup>8</sup>	15,466	12,676	45

<sup>1</sup> 2005-2006 [http://vpf-web.harvard.edu/budget/factbook/current\\_facts/2006OnlineFactBook.pdf](http://vpf-web.harvard.edu/budget/factbook/current_facts/2006OnlineFactBook.pdf)

<sup>2</sup> 2006-2007 <http://www.stanford.edu/home/statistics/#enrollment>

<sup>3</sup> 2005-2006 <http://web.mit.edu/ir/cds/2006/b.html>

<sup>4</sup> 2005-2006 <http://www.ox.ac.uk/aboutoxford/annualreview/app2ii.shtml>

<sup>5</sup> 2004-2005 <http://www.admin.cam.ac.uk/reporter/2004-05/special/19/studentnumbers2005.pdf>

<sup>6</sup> Kahn and Malingre (2007)

<sup>7</sup> 2006-2007 Beijing University Admission Office

<sup>8</sup> 2004 [http://www.u-tokyo.ac.jp/stu04/e08\\_02\\_e.html](http://www.u-tokyo.ac.jp/stu04/e08_02_e.html)

In many cases, world-class universities have students and faculty who are not exclusively from the country where the university operates. This enables them to attract the most talented people, no matter where they come from, and open themselves to new ideas and approaches. As a matter of fact, the international dimension is becoming increasingly important in determining the configuration of these elite institutions. Both the THES

world ranking of universities and Newsweek's 2006 ranking of Global Universities weighted their rankings to favor institutions with strong international components. Harvard University, for instance, has a student population that is 19 percent international; Stanford has 21 percent; and Columbia, 23 percent. At Cambridge University, 18 percent of the students are not from the UK or EU countries. The US universities ranked at the top of the global surveys also show sizeable proportions of foreign academic staff. For instance, the proportion of international faculty at Harvard, including medical academic staff, is approximately 30 percent. Similarly, the proportion of foreign academics at Oxford and Cambridge is 36 and 33 percent, respectively. By contrast, in France only 7 percent of all researchers are foreign academics. Unquestionably the world's best universities enroll and employ large numbers of foreign students and faculty in their search for the most talented.

The new patterns of knowledge generation and sharing, documented by Gibbons (1994) in his path breaking work on the shift towards a problem-based mode of production of knowledge, are characterized by the growing importance of international knowledge networks. In this respect, the fact that world-class universities succeed in mobilizing a broadly diverse national and international academic staff is likely to maximize these institutions' knowledge networking capacity.

2.2 Abundant Resources. Abundance of resources is the second element that characterizes most world-class universities, in response to the huge costs involved in running a complex research-intensive university. These universities have four main sources of financing: government budget funding for operational expenditures and research, contract research from public organizations and private firms, the financial returns generated by endowments and gifts, and tuition fees.

In Western Europe, public funding is by far the principal source of finance for teaching and research, although the top UK universities have some endowment funds and top-up fees have been introduced in recent years. In Asia, the National University of Singapore, which became a private corporation in 2006, has been the most successful institution in terms of endowment funding. It has managed to build up a sizeable portfolio of 774 million dollars through effective fund-raising, making it richer than any British university after Cambridge and Oxford. The US and to a lesser extent Japan have thriving private research universities. The sound financial base of the top US universities is due to two factors. First they have large endowments (Table 3) which provide budget security, comfort, and the ability to focus on institutional priorities over medium and long-term. Unlike many universities in Europe, they are not at the short-term mercy of government funding sources or the whims of changing political priorities.

**Table 3 – Comparison of US and UK Endowment Levels**

<b>US Institutions</b>	<b>Endowments Assets (2006 million \$)</b>	<b>UK Institutions</b>	<b>Endowment Assets (2002 million \$)</b>
Harvard University	28,916	Cambridge	4,000
Yale University	18,031	Oxford	4,000
Stanford University	14,085	Edinburgh	3200
University of Texas	13,235	Glasgow	240
Princeton University	13,045	King's	200

Source: 2006 NACUBO Endowment Study, 2007 National Association of College and University Business Officers. University Endowments – UK/US Comparison, May 2003, retrieved on 17 March 2007 from [http://www.suttontrust.com/reports/endowments\\_report.pdf](http://www.suttontrust.com/reports/endowments_report.pdf)

Second they benefit from the success of their faculty in competing for government research funding. At least two-thirds of the research funding captured by the top US research universities comes from public sources. The top ranking Canadian universities in international league tables are also the top universities in research income (Salmi and Saroyan, 2007).

These abundant resources create a virtuous circle that allows the concerned institutions to attract even more top professors and researchers, as is often the case among elite universities in the US. Among the 20 top ranked universities in the US, only two -- Michigan State and Berkeley-- are public. Annual surveys of salaries indicate that private universities in the US pay their professors 30 percent more than public universities on average (CHE, 2007).

**2.3 Appropriate Governance.** The third dimension concerns the overall regulatory framework, the competitive environment and the degree of academic and managerial autonomy that universities enjoy. In a recent survey report, The Economist (2005) referred to the tertiary education system in the United States as “the best in the world” and associated this success not only to its wealth but to its relative independence from the state, the competitive spirit that encompasses every aspect of it, and its ability to make academic work and product relevant and useful to society. The article observed that the environment in which universities operate fosters competitiveness, unrestrained scientific inquiry, critical thinking, innovation, and creativity. Moreover, institutions that have complete autonomy are also more flexible because they are not bound by cumbersome bureaucracies and externally imposed standards, notwithstanding the legitimate accountability mechanisms which bind them. As a result, they can manage their resources with agility and quickly respond to the demands of a rapidly changing global market.

The autonomy elements outlined above are necessary though not sufficient to establish and maintain world-class universities. Other crucial governance features are needed such as inspiring and persistent leaders, a strong strategic vision of where the institution is going, a philosophy of success and excellence, and a culture of constant reflection, organizational learning and change.

The cases of Germany and France are interesting to discuss in this context. Even though they are among the top economies in the world, their universities are hardly recognized as elite institutions. In 2006, the best French university was ranked 46<sup>th</sup> by SJTU and the first German university was ranked 51. Benchmarking them against the three sets of criteria proposed above shows clearly why universities of these two countries do not shine in international rankings. To begin with, there is very little screening of students entering tertiary education. In most programs, having graduated from secondary school is the only prerequisite to admission (with the exception of the highly selective French engineering and professional “Grandes Ecoles”).

Another important factor is the absolute lack of competition among universities. All universities are treated equally in terms of budget and assignment of personnel, making it quite difficult if not impossible to mobilize the necessary resources to set up centers of excellence with a large concentration of top researchers. For both Germany and France, per student public expenditures on tertiary education are slightly below the OECD average, and half the level of US universities. When the first SJTU ranking was published at the end of 2003, the daily paper *Le Monde* ran an article on January 24, 2004 entitled “The great misery of French universities.” The university presidents and union leaders interviewed for that article argued that the lack of budgetary resources and the rigidities associated with their utilization was one of the main explanations for the demise of the French university system.

Finally, in both countries, universities are government entities constrained by civil service employment rules and rigid management controls. This means, in particular, that it is not possible to pay higher salaries to reward the more productive academics or attract world-class researchers and to invest in leading edge research facilities. For example, the salaries of French business administration professors are 20 percent lower than those of their US counterparts (Egide, 2007).

In the case of France, two additional structural features complicate the situation further. First, according to Orivel (2004), one of the main reasons why French universities are not internationally competitive is the dual structure of the tertiary education system. The top engineering and professional schools (“*Grandes Ecoles*”) recruit the best students through very competitive national examinations, while the universities receive the bulk of secondary school graduates who have automatic access. Since the *Grandes Ecoles* are predominantly elite professionally-oriented schools, they conduct very little research; as a result, most doctoral students in the research universities do not come from the most academically qualified student groups. This is quite unlike the practice in more competitive university systems in the US, the UK or Japan. Second, the strict separation between the research institutes affiliated with the National Centre for Scientific Research (CNRS) and the research departments of the universities results in the dispersion of human and financial resources. The strength of world-class universities is that research is integrated at all levels.

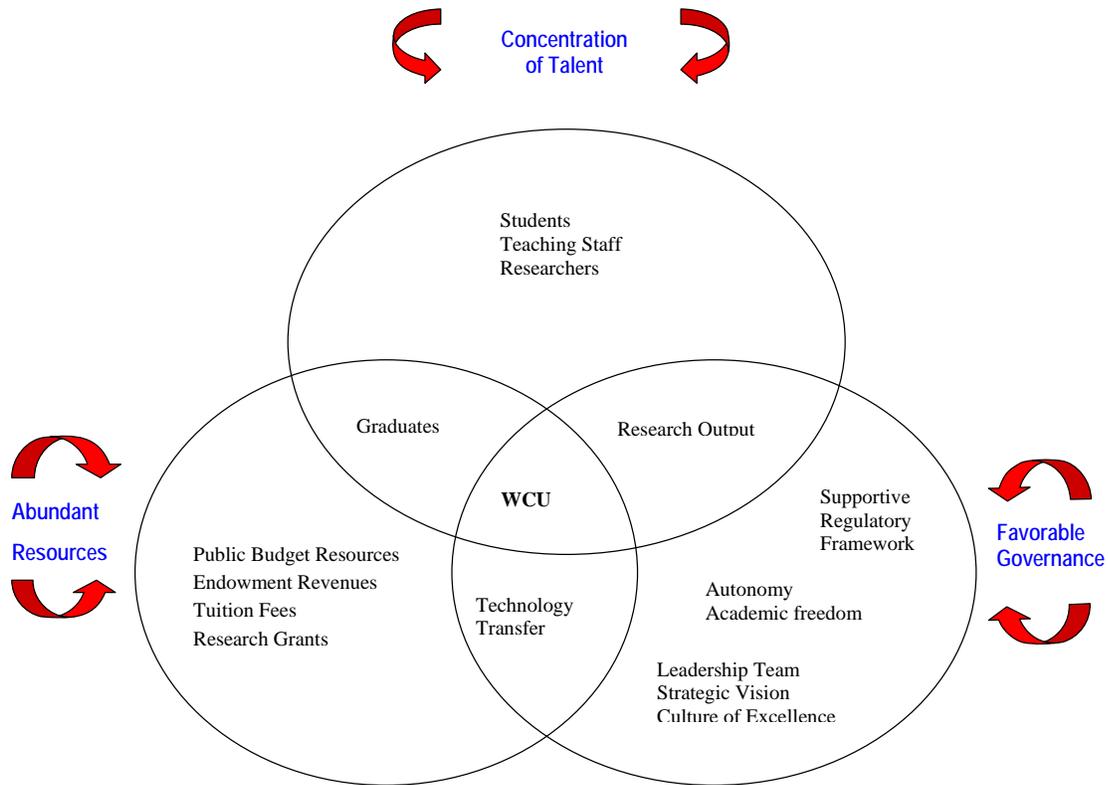
**Box 1 – Watching the Rankings: the French Experience**

Each year, when Shanghai's Jiao Tong University publishes its world ranking of universities, France responds with a mix of indignation and consternation. Indignation, because French educators complain that the system favours “Anglo-Saxon” universities and makes no allowance for France's unusual division into elite grandes écoles and mass universities. Consternation, because not a single French university makes it into the world's top 40. Its best-placed institution—Paris VI—manages only 45th place.

Source: The Economist (28 October 2006). “Lessons from the Campus.” Special Survey Section on France.

2.4 Alignment of Success Factors. Finally, it is important to stress that it is the combination of these three sets of features, concentration of talent / abundant funding / appropriate governance, that makes the difference. The dynamic interaction among these three groups of factors is the distinguishing characteristic of high-ranking universities (Figure 1).

**Figure 1 - Characteristics of a World-Class University  
Alignment of Key Factors**



Source: Elaborated by Jamil Salmi

Just investing money in an institution or making it very selective in terms of student admission is not sufficient to build a world-class university, as illustrated by the case of Brazil's top university, the University of São Paulo (USP). Brazil is the 5th most populated nation and the 10th largest economy on the planet, it has world class companies such as Embraer and Aracruz Celulose, but there is no Brazilian university among the 100 top ranked universities in the world.

How is it that USP, the country's foremost university, does not make it into the top group in the international rankings, despite having some of the features of world-class universities? When it was created in 1934, USP leaders made it a point to hire only prominent professors from all over Europe (Schwartzman, 2005). Today it is the most selective institution in Brazil, it has the highest number of top-rated graduate programs and it produces every year more Ph.D. graduates than any US university. At the same time, its ability to manage its resources is constrained by rigid civil service regulations, even though it is the richest university in the country. It has very few linkages with the international research community and only 3 percent of its graduate students are from outside Brazil. The university is very inward-looking: most students come from the State of São Paulo and most professors are USP graduates. Foreign professors cannot be recruited by law and it is forbidden to write a doctoral dissertation in a language other than Portuguese. According to Schwartzman (2005), the key missing element is the absence of a vision of excellence to challenge the status quo and transform the university. This lack of strategic vision can be observed as much at the national and state government level as well as at the helm of the university itself.

### 3. Paths to Transformation

Infosys and Wipro are great role models. I cannot say that I will be as great as them, but today India is producing more entrepreneurs than any other country. ... As chairman of Jet Airways, I definitely would like to see India able to create a world-class airline. We should not be inferior to Singapore and Cathay Pacific in terms of reliability and standards of service. We will hire the best brains, the best talent. We aim to be second to none.

Jet Airways Founder and Chairman, Naresh Goyal  
Newsweek interview, 16 July 2007

Two complementary perspectives need to be considered in examining how to establish new world-class universities. The first dimension, of an external nature, concerns the role of government at the national / state / provincial level and the resources that can be made available to enhance the stature of institutions. The second dimension is internal. It has to do with the individual institutions themselves and the necessary evolution and steps they need to take to elevate themselves to world-class institutions.

**Comment [AS1]:** Should you add provincial here? I am thinking of the Canadian context where education is within provincial jurisdiction.

**Comment [AS2]:** Would it be clearer if you categorized them as external and internal?

#### 3.1 Role of Government

In the past, the role of government in nurturing the growth of world-class universities was not a critical factor. The history of the Ivy Leagues universities in the US reveals that, by and large, they grew to prominence as a result of incremental progress rather than

deliberate government intervention. Similarly, Oxford and Cambridge evolved over the centuries of their own volition, with public funding, but with considerable autonomy in terms of governance, definition of mission and direction. Today, however, it is unlikely that a world-class university can be rapidly created without a favorable policy environment and direct public initiative and support, if only because of the high costs involved in setting up advanced research facilities and capacities.

Altbach (2004) reports a late nineteenth century conversation between John D. Rockefeller and the then President of Harvard University, Charles W. Eliot, where the former asked the latter what would be the cost of establishing a world-class university. Eliot's answer was "50 million dollars and 200 years." But in fact the University of Chicago was able, at the beginning of the twentieth century, to achieve this goal within twenty years, at a price tag of less than 100 million dollars. Professor Altbach's estimate puts the cost of creating a world-class university today at around 500 million dollars.

In that respect, one of the key questions that national authorities need to ponder is how many world-class universities their country can afford and to make sure that investment for that purpose will not cost at the expense of investing in other priority areas. Adopting the goal of building world-class universities, however, does not imply that all universities in a given country can or should aspire to be of international standing. A more attainable goal could rather be to set up an integrated system of teaching, research, and technology-oriented institutions that feed into and support a few centers of excellence that focus on value-added fields and chosen areas of comparative advantage, and can eventually evolve into world-class institutions. Even in the richest OECD countries, only a handful of institutions achieve the kind of concentration of top researchers, professors, students, facilities, and resources that world class universities enjoy as pre-conditions for excellence in scholarship. In the US, for example, of about 5,000 tertiary education institutions no more than 30 universities are among the best in the world; in the UK less than 10 universities and in Japan no more than 5 belong to this category.

The next relevant set of questions is about the most effective approach to achieve the proposed goal of becoming world-class. International experience shows that three basic strategies can be followed to establish world-class universities. First, the government could consider upgrading a small number of existing universities that have the potential of excelling (picking winners). A second strategy would consist in encouraging a number of existing institutions to merge and transform into a new university that would achieve the type of synergies corresponding to a world-class institution (hybrid formula). A third approach would be to create new universities from scratch (clean slate approach). Each one of these approaches presents advantages and drawbacks.

3.1.1 Upgrading Existing Institutions. One of the main benefits of this first approach is that the costs can be significantly less than building new institutions from scratch. This is the strategy followed by China since the early 1980s.

### Box 2 - Tertiary Education Reform in China

The Chinese government has been eager to develop a tertiary education system of international stature and recent reform efforts reflect this goal. In 1993, the Government adopted the *Guidelines of China's Educational Reform and Development*, which called among other things to build up 100 key universities with high quality courses of specialized studies. In 1998, then President Jiang Zemin announced the goal of building world-class universities, with a clear focus on the advancement of science and technology. Since then, state financing for tertiary education has more than doubled, reaching \$10.4 billion in 2003 or almost 1% of GDP. Several top universities received grants to improve institutional quality under the 985 Project, which reflects a conscious strategy to concentrate resources on a few institutions with the greatest potential for success at the international level.

Chinese universities are currently spending millions of dollars to recruit internationally renowned, foreign-trained Chinese and Chinese-American scholars and build state of the art research laboratories, particularly in science and technology. The strategy is to surround their star faculty with the brightest students, give them academic leeway and provide competitive salary and additional non-salary incentives. With low labor costs, structural upgrades are achievable at a tenth of the cost in industrial countries. All this is happening in the context of a new regime of financial autonomy, significant cost sharing, and intense efforts to develop management expertise at all levels of university leadership.

Source: French (2005); Mohrman (2005).

But this approach is unlikely to succeed in countries where the governance structure and arrangements that prevented the emergence of world-class universities in the first place are not drastically revised. A comparison of the experiences of Malaysia and Singapore can serve to illustrate this point. Since Singapore was initially one of the provinces of the Malaysian Kingdom during the first few years following independence from the British, contrasting the stories of the University of Malaya and of the National University of Singapore (NUS) can be quite instructive given that they departed from common cultural and colonial origins. At independence, the University of Malaya operated as a two-campus university, one in Kuala Lumpur and the other in Singapore. The former evolved into the flagship University of Malaya from the very beginning, and the other became the University of Singapore (before merging with Nanyang University in 1980 to create the National University of Singapore). Today, NUS functions as a true world-class university (ranked 19<sup>th</sup> by the 2006 THES) while the University of Malaya struggles as a second-tier research university (ranked 192<sup>nd</sup>).

In examining the different evolutionary paths of these two institutions, several factors appear to be constraining the University of Malaya's capacity to improve and innovate as the NUS has. The first one is the affirmative action policy implemented by the Malaysian government in favor of the children of the Malay majority population (*Bumiputras*), which prevents the university from being selective in its student admissions and targeting only the best and brightest in the country. In addition the Ministry of Higher Education places a 5 percent cap on the number of foreign undergraduate students that public universities can enroll, while the proportion of foreign students at NUS is 20 percent at undergraduate level and 43 percent at graduate level.

Second, NUS is able to mobilize almost twice as many financial resources as the University of Malaya (\$ 205 million annual budget vs. \$ 118 million) through cost-sharing, investment revenue, fund raising and government resources. As a result, the annual per student expenditures were \$6,300 and \$4,053, respectively. Third, in Malaysia, civil service regulations and a rigid financial framework make it difficult, if not impossible, to provide competitive compensation packages to attract the most competent professors and researchers, including foreign faculty. NUS, on the contrary, is free to bring in top researchers and professors from all over the world, pay a global market rate for them, and provide performance incentives to stimulate competition and to retain the best and the brightest. As a matter of fact, a good number of Malaysia's top researchers have been recruited by NUS.

**Box 3 - Do Governments Care about Higher Education?  
Lessons from the Soccer Field**

For the sake of argument, let us consider the following: how would Barcelona's professional soccer team (FC Barcelona) perform if it were constrained by all the rules that burden our universities? What would happen if all the players were civil servants with salaries determined by a government ministry and if they were allowed to continue playing every day regardless of their performance during official games and behavior during practice sessions? What would happen if the club's income was not linked to its game results, if it could not pay higher salaries to attract the best players in the world or if it could not quickly get rid of the underperforming players? What would happen if team strategy and tactics were decided by the government rather than by the coach? Wouldn't such an approach risk relegating the Barcelona team to the sidelines of mediocrity? If we agree that such an approach is unwise for a sports team, why do we allow our universities to operate under such conditions? This suggests that, deep down, we care more about soccer than about the education of our children.

Adapted by Jamil Salmi and Richard Hopper from Sala I Martín, X. (2006). "A great sense of humor", *Vanguardia*, 17 November 2006.  
Professor Sala I Martín teaches at Colombia University in the US and Universidad Pompeu Fabra in Spain

Governments need therefore to construct a supportive external policy environment and create the financing and regulatory conditions that will enable and encourage their universities to compete at an international level on a host of indicators on which the quality and relevance of university education are commonly assessed (see box 3) including reputation and awards, foreign students and faculty, and research grants. One way to facilitate this is to grant management autonomy to the universities, another is provide performance-based financing, and yet another one is to put in place favorable taxation systems that will allow companies and philanthropists to make tax-free donations to universities. The US and India provide good examples of this practice.

3.1.2 Merging Existing Institutions. The second possible approach consists of promoting mergers among existing institutions. France and Denmark are two countries that have diligently embarked on this path in recent years. In France, individual universities and “*grandes écoles*” are exploring the feasibility of merging on a regional basis. In Denmark, the government has set up an Innovation Fund that would reward, among other things, the combination of similar institutions. In China, too, a number of mergers have taken place to consolidate existing institutions. For example, Beijing Medical University merged with Beijing University in 2000; similarly in Shanghai Fudan University merged with a medical university, and Zhejiang University was created out of the merger of five universities. In 2004, in the UK, the Victoria University of Manchester (VUM) and the University of Manchester Institute of Science and Technology (UMIST) merged, creating the largest university in the UK, with the purposefully stated goal of being “top 25 by 2015” (<http://www.manchester.ac.uk/research/about/strategy/>). Also in the UK recently, Cardiff University and South Wales School of Medicine have merged as a deliberate step to establish a world-class university in Wales. These mergers to create larger universities are a clear response to the fact that international rankings compare the number of research publications of institutions independently from the size of their student enrollment.

The great advantage of mergers is that they can result in stronger institutions able to capitalize on the new synergies that their combined human and financial resources may generate. But mergers can work both ways, carrying also the risk of aggregating problems instead of resolving them. In the case of France, for example, mergers would augment the critical mass of researchers and bring about a higher place in the SJTU ranking that favors research output. But they would not address the fundamental limitations that French universities suffer from, namely the inability to select incoming students, a weak financial basis, rigid governance arrangements and outdated management practices. The Danish case has greater chances of success since the push for mergers is taking place within the context of an overall governance reform aiming at transforming all universities in the country into more flexible and dynamic institutions (see Annex 4).

The second danger associated with mergers is that the newly consolidated institution could be dysfunctional because of clashing institutional cultures. It has become clear, for example, that the previously mentioned merger between VUM and UMIST has not been as successful as expected. Currently acknowledging a £30 million budget deficit and the likelihood of up to 400 jobs lost on the campus (Qureshi, 2007), the University of Manchester has had immediate experience with the complexities of merging—including duplication of staff and curricular offerings, and the short-term absorption of labor contracts and institutional debt. In addition, the newly formed institution, with its commitment to achieving world-class status, invested heavily in hiring ‘superstar’ academic staff and supplying them with correspondingly ‘superstar’ facilities. This exacerbating further the staffing debt that the institution inherited with the merging of the distinct and separate institutional staffs—and their individual cultures, norms, and labor contracts—into the one university. It remains to be seen how Manchester will address these financial, cultural and inter-personal obstacles while simultaneously maintaining its quest for world-class status.

Thus, one of the main challenges when undertaking a merger is to create a shared academic culture and transformation vision among all constituting units (faculties, schools, departments) and bring internal coherence to the newly-established institution. In many cases, the leaders of merged universities are severely constrained by the high level of independence claimed by constituting units. The new university established by merging existing universities may carry the legacy of the old brands which in many cases can be an obstacle in attracting excellent students and staff.

3.1.3 Creating New Institutions. In countries where institutional habits, cumbersome governance structures and bureaucratic management practices prevent traditional universities from being innovative, creating new institutions maybe the best approach, provided that it is possible to staff them with people not influenced by the culture of the traditional universities and provided that financial resources are not a constraint. New institutions can emerge from the private sector or governments can allow new public institutions to operate under a more favorable regulatory framework. Kazakhstan is a country intent on following this path as it seeks to make its economy less dependent on oil and more competitive overall. The Government of Kazakhstan has decided to set up a new International University in Astana. The plan is that this university will follow a highly innovative multidisciplinary curriculum in cooperation with leading international universities.

One of the earlier success stories in that respect was the establishment of the Indian Institutes of Technology which, in the past decades, have gradually risen to world-class status (Box 4).

#### Box 4 - The Indian Institutes of Technology: a Success Story

Soon after becoming independent, India placed science and technology high on its economic development agenda. The first Indian Institute of Technology (IIT) was established in 1951 at Kharagpur, (West Bengal) with support from UNESCO, based on the MIT model. The Second IIT was established at Bombay (now Mumbai) in 1958 with assistance from the Soviet Union through UNESCO. In 1959, IIT Madras (now Chennai) was established with assistance from Germany; and IIT Kanpur with help from a consortium of US Universities. British industry and the UK Government supported the establishment of IIT Delhi in 1961. In 1994, IIT Guwahati was established totally through indigenous efforts. In 2001, the University of Roorkee was brought under the IIT family as the seventh such institution.

While taking advantage of experience and best practices in industrial countries, India ensured that the “institutions represented India’s urges and India’s future in making” (Prime Minister Nehru, 1956). The Indian Parliament designated them as “Institutes of National Importance” - publicly funded institutions enjoying maximum academic and managerial freedom- offering programs of high quality and relevance in engineering, technology, applied sciences and management at undergraduate, masters, and doctorate level and offering their own degrees. Student admissions are made strictly according to merit through a highly competitive common entrance test.

Today, the IITs attract the best students interested in a career in engineering and applied sciences. With 4,000 new students selected out of 250,000 applicants every year, the IITs are more selective than the top US Ivy League schools. Several IIT alumni occupy the highest positions of responsibility in education, research, business and innovation in several parts of the world. In 2005, The Times Higher Education Supplement ranked the IITs as globally third best engineering school after MIT and the University of California, Berkeley.

The main strength of the IITs has been their sustained ability to attract the best students and turn them into “creative engineers” or “engineer entrepreneurs”. Initially IITs were criticized for their contribution to the brain- drain as about 40% of the graduates went abroad. Today, with the opening and fast growth of the Indian economy, this “weakness” is turning into a big strength for international cooperation and investments. Much of the success of Bangalore, for instance, is attributed to the phenomenon of reverse brain drain.

Elaborated by Shashi Shrivastava and Jamil Salmi

A third promising example is the creation of the Paris School of Economics (PSE) in February 2007, modeled after the London School of Economics. This initiative combines elements of mergers with the creation of a brand new type of institution in the French context (Kahn and Malingre, 2007). Co-sponsored by 4 “*grandes écoles*”, the Paris I University (Sorbonne) and the National Research Institute (CNRS), PSE will operate as a

private foundation regrouping the best economics departments from the participating institutions. Its initial funding comes not only from the State and the Region but also from private companies and a US foundation. Unlike traditional French universities, PSE will be highly selective in terms of incoming students. Many of the core professors will come from the most prestigious universities in the world.

The creation of new institutions may also have the side benefit of stimulating existing ones into becoming more responsive to a more competitive environment. Examples from many parts of the world showing that the emergence of high quality private universities in countries with a predominantly public tertiary education sector has provoked the public universities into becoming more strategically focused. In Uruguay, the venerable University of the Republic—which had exercised a monopoly over tertiary education in the country for 150 years—started a strategic planning process and considered establishing postgraduate programs for the first time only after being confronted in the mid-1990s with competition from newly established private universities. Similarly, in Russia, the creation of the Higher School of Economics and of the Moscow School of Social and Economic Sciences in the 1990s pressured the department of economics at the State University of Moscow to revamp its curriculum and get more actively involved in international exchanges.

To maintain the favorable conditions that were instrumental for the establishment of a new world-class institution requires constant vigilance, as the growing faculty shortage faced by the Indian Institutes of Technology illustrates. India's economic success has translated into a much larger income gap than in the past between the Institutes and industry. As a result, fewer promising graduates seek an academic career (Neelakantan, 2007). Without the autonomy to raise salaries and offer more competitive employment packages, the IITs are at risk of losing their competitive edge. The younger Indian Institutes of Management face the same hurdle in their quest for world-class status (Bradshaw, 2007).

3.1.4 Evaluation of these Approaches. Table 4 attempts to summarize the positive and negative aspects linked to each approach (upgrading, merging or creating new institutions). It should be noted that these generic approaches are not mutually incompatible and that countries may pursue a combination of strategies based on these models.

**Table 4 – Costs and Benefits of Strategic Approaches  
for Establishing World-Class Universities**

<b>Approach</b> <b>Conditions</b>	<b>Upgrading Existing Institutions</b>	<b>Merging Existing Institutions</b>	<b>Creation New Institutions</b>
<b>Ability to Attract Talent</b>	Difficult to renew staff and change the brand to attract top students	Opportunity to change the leadership and to attract new staff. Existing staff may resist	Opportunity to select the best (staff and students). Difficulties in recruiting top students to “unknown” institution. Need to build up research and teaching traditions.
<b>Costs</b>	Less expensive	Neutral	More expensive
<b>Governance</b>	Difficult to change mode of operation within same regulatory framework	More likely to work with different legal status than existing institutions	Opportunity to create appropriate framework
<b>Institutional Culture</b>	Difficult to transform from within	May be difficult to create a new identity out of distinct institutional cultures	Opportunity to create culture of excellence
<b>Change Management</b>	Major consultation and communication campaign with all stakeholders	“Normative” approach to educate all stakeholders about expected norms and institutional culture	“Environmental adaptive” approach to communicate and socially market the new institution

Countries deciding to establish world-class universities by upgrading or merging existing ones must also choose an appropriate methodology to select among existing universities. Governments need to assess the degree to which they want to manage the process in a centralized way, cherry-picking institutions where centers of excellence could be established or boosted, or whether it would be preferable to steer the tertiary education system at a distance, relying on broad strategic orientations and financial incentives to entice the most dynamic universities to transform themselves.

International experience suggests that, in medium to large-size countries, the latter approach could be more effective in the long run. The China ‘211’ project, the Brain 21 program in South Korea, the German “Initiative for Excellence” and the Millennium Institutes recently established in Chile are examples of how countries stimulate the

creation or consolidation of research centers of excellence. Annex 5 describes the most recent “excellence” initiatives implemented throughout the world.

**Box 5 – The German “Initiative for Excellence”**

In January 2004, the federal Ministry of Education and Research launched a national competition to identify about 10 universities with the potential of becoming elite universities. Extra funding will be provided under three windows: to entire institutions aiming to become world-class universities, to centers of excellence with international recognition, and to graduate schools intent of strengthening the quality of their programs.

After initial resistance from the States jealous of their traditional authority in the area of tertiary education funding, a compromise was reached and a joint commission was established, with representatives of the German Research Foundation and the Science Council.

In January 2006, the Commission selected 10 universities among 27 candidates, 41 proposals for centers of excellence among 157 submissions, and 39 graduate schools among 135 proposals. The majority of selected universities (7 out of 10) are located in two states (Baden-Württemberg and Bavaria) and only 10 percent of the winning centers of excellence are in the humanities and social sciences. Most of the selected graduate schools have a strong multi-disciplinary focus. A total of 2.3 billion dollars of additional funding will be made available to support the winning proposals over a period of four years.

Source: Kehm (2006)

Finally, it is important to stress that the national government is not the only major player when it comes to facilitating the establishment of world-class institutions. In large countries and/or federal systems, regional or provincial authorities can play a critical role, as illustrated by the active role played by the Californian authorities in designing and establishing an integrated system of tertiary education in the Sixties, or more recently in establishing special Innovation Funds to strengthen linkages between the research universities and the regional economy. Similarly, the Shanghai municipality has given active support to its leading universities in the past ten years as part of its accelerated development policies and, in the State of Nuevo León in Mexico, the business community has also contributed substantially to the success of the Technology Institute of Monterrey.

### 3.2 Strategic Dimensions at the Institutional Level

3.2.1 Leadership and Strategic Vision. The establishment of a world-class university requires, above all, a strong leadership, a bold vision of the institution's mission and goals, and a clearly articulated strategic plan to translate the vision into concrete programs and targets.

Recent research on university leadership suggests that, in the case of top research universities, the best performing institutions have leaders who combine good managerial skills and a successful research career (Goodall, 2006). To be able to develop an appropriate vision for the future of the university and to implement this vision in an effective manner, the university president / vice-chancellor / rector needs to fully understand the core agenda of the institution and to be able to apply the vision with the necessary operational skills.

A crucial element of the vision is the discovery of a niche market towards which the institution will seek to build and maximize its comparative advantage. In that respect, it is important to underline that a university, even a world-class university, most likely cannot excel in all areas. Harvard University, widely recognized as the number one institution in the world, is not the best ranked university in all disciplines. Its strengths are especially noted in economics, medical sciences, education, political science, law, business studies, English and history.

Part of the vision-setting will therefore consist in delineating the main areas where the institution wishes and has the potential to operate at the forefront. Some world-class institutions, such as the Indian Institutes of Technology, have specialized in a few engineering disciplines. The London School of Economics is best known for outstanding scholarship in economics, sociology, political science and anthropology. Even though Swiss universities do not reach the top 50, the Lausanne Hotel Management School (*Ecole Hôtelière de Lausanne*), the only European School accredited by the New England Association of Schools and Colleges, is considered to be one of the best in the world together with the University of Nevada and Cornell University's Schools of Hotel Administration.

In identifying a distinct area of emphasis, institutions aspiring to become world-class universities do not need to replicate what the current top universities do. They can innovate in many different ways. They can for instance choose a radically different approach to organize the curriculum and pedagogy of the institution, as the newly established Olin College in Massachusetts and LimKokWing University College of Creative Technology in Malaysia have attempted in the field of engineering and technology. Or they may opt for linking their transformation to shifting regional or local development opportunities, as illustrated by the example of Clemson University in South Carolina (see box 6).

**Box 6 – Developing a New Vision at Clemson University**

Clemson University, a land grant university in South Carolina traditionally focused on agriculture and mechanical engineering, has undertaken a radical transformation process in recent years. Based on an in-depth analysis of the conversion of South Carolina into one of the leading automotive regions in the US, Clemson University formed a strategic partnership with BMW with the aim of recreating itself as the premier automotive and motor sports research and education university. Its new vision statement specifically mentions the target of becoming one of the nation's top-20 public universities (as measured by *US News and World Report*), up from rank 74 four years ago and 34 in 2005.

Source: Presentation by Chris Przirembel, Vice-President for Research and Economic Development, Clemson University, at MIT Conference on Local Innovation Systems, Cambridge, Massachusetts, 13 December 2005.

3.2.2 Sequencing. The time dimension is an important aspect that needs also to be factored into the strategic plan of the aspiring world-class university. Developing a culture of excellence does not happen from one day to the other. Proper sequencing of interventions and careful balance between the quantitative objectives are required in order to avoid experiencing the kinds of growing pains that some of the Chinese universities have encountered (Box 7).

### **Box 7 – Obstacles to the Transformation of Chinese Universities**

There are signs that China's plans to achieve world-class stature are meeting some obstacles. First is the concern that Chinese universities have expanded too quickly at the expense of maintaining quality. Second, the academic culture that demands quick results hampers innovative and long-term research efforts. While the "publish or perish" culture is strong in the United States, such pressures are often balanced with the recognition of the value of creativity and originality. Lack of undergraduate students with a strong foundation in science and technology is the third weakness. Without well-trained students entering the graduate programs, first-class faculty and laboratories will be underutilized. Fourthly, lack of academic freedom is a serious issue in China. Faculty and students are encouraged to question government policies or engage in debates on pressing issues in only a limited way, with some disincentive for creative thinking.

Finally, China's vision of world class universities focuses almost exclusively on factors such as increased publications in international journals, up-to-date laboratories, more buildings, star professors and additional funding (Mohrman 2003). Yet the vision is largely imitative rather than creative. Ruth Simmons (2003), president of Brown University, emphasizes the importance of other factors: "the bedrock of university quality in the United States is peer review, a system in which standards are set by leaders of the field and those leaders are themselves challenged and judged by this process". Simmons goes on to note that "universities promote the capacity of scholars to develop original work that is not immediately applicable or useful. Great universities are not only useful in their own time but in preparing for future times. What allows a great university to do that is as little interference from the state as possible. The role of the state is to provide resources but to give wide latitude to universities' leaders to decide how scholarship is to advance." Their universities might do better to focus on building world-class departments, institutes or schools, rather than trying to excel on all accounts (Altbach 2003).

It is important to stress that vision development and strategic planning are not a one-time exercise. In a highly competitive environment, the more successful organizations in both business and academia are those that are relentless in challenging themselves in the pursuit of better and more effective ways of responding to client needs. With constant replenishment of intellectual capital, performance is never static in the best universities. The most successful institutions are not content with relying on past accomplishments but always aspire to be among the best in the world and, internally, they create an atmosphere of competitiveness that lets them do just that.

Not even the most famous universities are immune from the necessity to evolve and adapt to changing circumstances, as Oxford University's failed attempt at financial reform illustrates. In recent years, the University's central authorities have faced the need for additional resources to be able to continue hiring internationally renowned professors and

researchers in an increasingly competitive market for academics. But they have been constrained by traditional governance arrangements whereby the bulk of Oxford University's wealth is controlled by the individual colleges. One aspect of the reform proposals submitted in 2006 by John Hood, the new Vice-Chancellor recruited from New Zealand, was to give more power over these resources to the University's central leadership, while also allowing for increased financial oversight by outsiders. But the reform was rejected by Oxford's academic community (The Times, 2006).

**3.2.3 Internationalization Dimension.** One way of accelerating the transformation into a world-class university is to use the internationalization card effectively. An influx of top foreign students can be instrumental in upgrading the academic level of the student population and enriching the quality of the learning experience through the multi-cultural dimension. In this regard, the capacity to offer programs in a foreign language, especially English, can be a powerful attraction factor. Among the 100 top universities according to the SJTU ranking, 11 come from non native English speaking countries where some of the graduate programs are offered in English (Denmark, Finland, Israel, the Netherlands, Norway, Sweden, and Switzerland).

As discussed earlier, the ability to attract foreign professors and researchers is also an important determinant of excellence. Universities need to be able to offer incentives including flexible remuneration and employment conditions to bring on board, on a short or medium term basis, top academics from other countries. These individuals can help upgrade existing departments or establish graduate programs and research centers in new areas of competitive advantage. In cases where it is difficult to attract foreign faculty on a full-time basis, the university can start by bringing leading foreign scholars on a temporary basis.

To facilitate the contribution of foreign scholars, a number of aspiring world-class universities have formed fruitful partnerships with top universities in industrial countries. This was the case of the Indian Institutes of Technology in the early years of their establishment (see box 4). More recently, the National University of Singapore, one of the emerging world-class universities, has relied most on strategic alliances, for example with MIT, Harvard, Duke, Johns Hopkins University, Eindhoven University of Technology in the Netherlands, the Australian National University and Tsinghua University in China, to mention only the better known partner institutions.

Attracting leading scholars from the diaspora is another internationalization strategy that a few universities in India and China have implemented with success. Beijing University, for example, has hired hundreds of academics of Chinese origin. As part of its human resource strategy, the university closely monitors good Chinese scholars abroad and creates favorable conditions for their return.

**Box 8 - How Diasporas can contribute  
to Development in Home Countries**

A diaspora is a network of people coming from a same home country and living abroad. A successful diaspora network is characterized by the following three elements: (i) members of the diaspora are talented and show strong intrinsic motivation; (ii) they are involved in project implementation in their home country and serve as connectors, catalysts or vectors for projects development in the home country; (iii) its efficiency, continuity and development over time are based on concrete activities with measurable outcomes.

In most cases, diasporas and expatriate networks emerge spontaneously. However, government interventions can still be relevant to help develop or structure such initiatives. The first condition home countries need to fulfill in order to take advantage of these expatriate talents is to recognize them as an opportunity to develop a knowledge-based economy. Strategies to leverage diasporas vary with the country conditions on one hand, and the diaspora's characteristics on the other hand. Nevertheless, a common and critical element to efficiently use expatriate talent is the existence of solid institutions..

An excellent illustration of efficient search diaspora network is GlobalScot, a network of high powered Scots from all over the world who use their expertise and influence as antennae, bridges, and springboards to generate projects in Scotland. Launched in 2002, this network has proven extremely attractive and efficient with 850 influential businesspeople participating in 2005, and therefore contributing to Scotland's economic development strategy. Chile Global and Mexico Talent Abroad Network took GlobalScot as an inspiring model and are on the way to successfully adapt it to their respective specificities.

Diasporas as search networks can be compared to and learn from alumni networks. Therefore, there is a great opportunity for tertiary institutions to participate in the diaspora network process. Universities have indeed a potent comparative advantage to follow distinctive alumni, identify leaders abroad, and gradually build a search network. This is how successful diasporas begin.

Source: Kuznetsov, 2006

Related to this internationalization dimension is the extent to which national researchers have the linguistic competence to publish in English. One way in which institutions and academics advance their reputation is by their presence in scientific publications. Since citation indices compile data primarily from journals published in English, the facility with which academics can disseminate research results in English becomes a critical

factor in enhancing institutional reputation. Needless to say that institutions functioning in English are more likely to engender such success.

In some cases, universities have also found it useful to hire a foreign professional to lead the institution through the proposed transformation process. South Korea, the UK and Australia are examples of countries where this has happened in recent years. Of course, this approach is not always well accepted. Bringing an outsider to lead a flagship university can hurt national sensitivities and not many countries have shown the disposition to undertake international recruitment searches to fill the highest university positions. But this is one of the ways in which institutions can challenge themselves into “thinking outside the box” and embracing a change management mindset.

In the case of science and technology oriented universities, the ability to attract research contracts from foreign firms and multinational corporations is a good measure of how the scientific standing of rising universities is recognized by companies. In recent years, a few Chinese and Indian universities have received important research contracts from North American and European firms, sometimes at the expense of universities in the countries of origin of the companies (Yusuf and Nabeshima, 2007).

3.2.4 Summary Checklist. The following critical questions need to be reviewed to guide the quest towards establishing world-class universities:

At the National Level

- How many world class universities are desirable and affordable?
- What strategy would work best in the country context: upgrading of existing institutions, merger of existing institutions, or creation of new institutions?
- What should be the selection process (in the first or second case)?
- How will the transformation be financed?
- What are the governance and management arrangements that must be put in place to support this transformation?
- What will be government’s role in this process?

At the Institutional Level

- Does the institution have a winning leadership team?
- What is the overall vision and what are the specific goals that the university is seeking to achieve?
- In what niche(s) will it pursue excellence in teaching and research?
- How will the internationalization of the university be achieved?
- What is the likely cost of the proposed qualitative leap and how is it going to be funded?
- How will success be measured? What outcome indicators and accountability mechanisms will be used?

#### 4. Conclusion

Good is the enemy of great.  
Jim Collins

The highest ranked universities are the ones that make significant contributions to the advancement of knowledge through research, teach with the most innovative curricula and pedagogical methods under most conducive circumstances, make research an integral component of undergraduate teaching, and produce graduates who stand out because of their success in intensely competitive arenas during their education and, more importantly, after graduation. It is these concrete accomplishments and the international reputation associated with these sustained achievements that make these institutions world class.

There is no universal recipe or magic formula for “making” a world-class university. National contexts and institutional set-ups vary widely. Countries must therefore choose, among the various possible pathways, a strategy that plays to its former strengths and present resources. But international experience provides a few lessons regarding the key features of such universities (high concentration of talent, abundance of resources, and flexible governance arrangements) and successful approaches to move in that direction, from upgrading or merging existing institutions to creating new institutions altogether.

Under any scenario, building a world-class university does not happen overnight. No matter how much money can be thrown at the endeavor, it is unrealistic to expect instant results. Creating a culture of excellence and achieving high quality outputs take many years.

Furthermore, the transformation of the university system cannot take place in isolation. The long term vision for creating world class universities, and its implementation, should be closely articulated with (i) the country’s overall economic and social development strategy, (ii) ongoing changes and planned reforms at the lower levels of the education system, and (iii) plans for the development of other types of tertiary education institutions in order to build an integrated system of teaching, research, and technology-oriented institutions.

In that respect, it is worth observing that, while world-class institutions are commonly equated with top research universities, there are also world-class tertiary education institutions which are neither research-focused nor operate as universities *strictu sensu*. The UK Open University, for example, is widely recognized as the premier distance education institution in the world, and yet it does not make the international rankings. Conestoga College in Ontario is ranked as the best community college in Canada, and in Germany the Fachhochschulen of Mannheim and Bremen have an outstanding reputation. Two European countries that have achieved remarkable progress as emerging knowledge economies, Finland and Ireland, do not boast any university among the top 50 in the world, but they have excellent technology-focused institutions. Even among universities, international rankings clearly favor research-intensive universities at the cost of excluding first-rate institutions that enroll primarily undergraduate students. As countries embark on the task of establishing world-class universities, they may also want to

Deleted: excellent

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consider the desirability of creating, besides research universities, excellent alternative institutions to meet the wide range of education and training needs that the tertiary education system is expected to satisfy.

### Annex 1 - THES 2006 Country Ranking

Country Ranking	Country	International Rank of Top University in Country
1	USA	1
2	UK	2
3	China	14
4	Australia	16
5	France	18
6	Japan	19
7	Singapore	19
8	Canada	21
9	Switzerland	24
10	Hong Kong	33
11	New Zealand	46
12	Denmark	54
13	India	57
14	Germany	58
15	South Korea	63
16	Netherlands	67
17	Mexico	74
18	Belgium	76
19	Ireland	78
20	Austria	87
21	Russia	93
22	Taiwan	108
23	Finland	116
24	Israel	119
25	Sweden	122
26	Thailand	161
27	Norway	177
28	Malaysia	185
29	Spain	190
30	Italy	197

## Annex 2 – Shanghai Jiao Tong University 2006 Country Ranking

Country Ranking	Country	Rank of Top University in Country
1	USA	1
2	UK	4
3	Japan	20
4	Canada	23
5	Switzerland	27
6	France	39
7	Netherlands	42
8	Denmark	46
9	Sweden	53
10	Germany	53
11	Australia	57
12	Israel	64
13	Norway	69
14	Finland	73
15	Russia	76
17	Singapore, Belgium, Italy, Brazil	102 – 150
21	Taiwan, South Korea, China, Spain, Argentina, Mexico	151 – 202
25	Czech Republic, Hong Kong, Ireland, Greece, New Zealand, South Africa	203 – 304
33	Hungary, India, Poland, Egypt	305 – 402
36	Chile, Turkey, Portugal, Slovenia	403 – 510

Source: 2007 Institute of Higher Education, Shanghai Jiao Tong University

### **Annex 3 Key Characteristics of World Class Universities**

A world class university:

- has an international reputation for its research
- has an international reputation for its teaching
- has a number of research stars and world leaders in their fields
- is recognised not only by other world class universities, e.g., US Ivy League, but also outside the world of higher education
- has a number of world class departments (i.e., not necessarily all)
- identifies and builds on its research strengths and has a distinctive reputation and focus, i.e. its 'lead' subjects
- generates innovative ideas and produces basic and applied research in abundance
- produces path breaking research output recognised by peers and prizes, e.g., Nobel Prize Winners
- attracts the most able students and produces the best graduates
- can attract and retain the best staff
- can recruit staff and students from an international market
- attracts a high proportion of postgraduate students, both taught and research
- attracts a high proportion of students from overseas
- operates within a global market and is international in many activities, e.g., research links, student and staff exchanges, throughput of visitors of international standing
- has a very sound financial base
- receives large endowment capital and income
- has diversified sources of income, e.g., government, private companies sector, research income, overseas student fees
- provides a high quality and supportive research and educational environment for both its staff and students, e.g., high quality buildings and facilities/high quality campus
- has a first class management team with strategic vision and implementation plans
- produces graduates who end up in positions of influence and/or power, i.e., movers and shakers, e.g., Prime Ministers and Presidents
- often has a long history of superior achievement, e.g., Oxford and Cambridge in the UK and Harvard in the USA
- makes a big contribution to society and our times
- continually benchmarks with top universities and departments worldwide
- has the confidence to set its own agenda

Source: Alden and Lin (2004)

## **Annex 4 - Higher Education Reform in Denmark: The University Act of 2003**

Through reforms in four key areas—institutional autonomy, institutional leadership, quality assurance and internationalization--, Denmark is in the process of transforming its university system into an independent sector contributing to broad national success by answering more effectively to the evolving labor market that it serves.

*Institutional autonomy: Increased independence for Denmark's universities.*

- As of 2003, all universities in Denmark are considered independent subsidiaries of the Ministry of Science, Technology, and Innovation.
- Funds are distributed based on established rates for research and on per student enrollments and completion, to establish more objective criteria for funding. Institutions are allowed to use their complete subsidies as they deem necessary, may also seek outside sources of funding, to complement the state contributions, and may establish profit-making activities.
- Performance Contracts, first introduced in 1999, serve as a kind of contract between the government and individual institutions regarding how that institution will seek to maximize its individual strengths. Institutions work to their strengths, as defined by themselves, and seek successes at points where they are most competitive.

*Institutional leadership.*

- Leadership at every level is balanced within and outside:
- Governance of the institution is primarily in the purview of an external majority university Board, whose members are elected, not appointed, and include representatives from both within and outside the university, including academic and administrative staff and students.
- Each university's Rector serves at the will of the Board.
- Deans are hired and supervised by the Rector and in turn hire and supervise Department Heads

Source: Universities Act 2003, retrieved on 12/14/05 from <http://www.videnskabsministeriet.dk>.

## Annex 5 - Recent Research “Excellence” Initiatives

Country	Number of Target Institutions and Eligibility Criteria	Resources Allocated	Investment Horizon
<b>Germany Excellence Initiative 2006</b> <sup>2</sup>	40 graduate schools 30 Clusters of Excellence (universities and private sector) 10 Top-level research universities	\$2.3 billion in total	Five year funding Two rounds: 2006, 2007
<b>Brain Korea 21 Program</b> <sup>3</sup>	<ul style="list-style-type: none"> <li>• Science and Technology: 11 Universities</li> <li>• Humanities and Social Sciences: 11 Universities</li> <li>• Leading Regional Universities: 38 Universities</li> <li>• Professional Graduate Schools in 11 Universities</li> </ul>	\$1.17 billion in total	7 years Two rounds in 1999
<b>Korea Science and Engineering Foundation (KOSEF)</b> <sup>4</sup>	1) Science Research Centers (SRC) /Engineering Research Centers (ERC): up to 65 centers 2) Medical Science and Engineering Research Centers (MRC): 18 Centers 3) National Core Research Centers (NCRC): 6 Centers funded in 2006	1) \$64.2M / year  2) \$7M / year  3) \$10.8M / year	1) up to 9 years 2) up to 9 years 3) up to 7 years  All 3 programs launched in FY 2002 or FY 2003
<b>Japan Top-30 Program (Centers Of Excellence for 21st Century Plan)</b> <sup>5</sup>	31 Higher Education Institutions	\$150 million / year (Program Total: 37.8B Yen)	5 year funding Launched in 2002 3 rounds: 2002, 2003, 2004
<b>Japan Global Centers of Excellence Program</b> <sup>6</sup>	50 – 75 Centers Funded per year (5 new fields of study each year)	50 – 500 Million Yen per center per year (~\$400,000 – \$4M)	5 years Launched in 2007

<sup>2</sup> [http://www.dfg.de/en/research\\_funding/coordinated\\_programmes/excellence\\_initiative/](http://www.dfg.de/en/research_funding/coordinated_programmes/excellence_initiative/)

<sup>3</sup> <http://unpan1.un.org/intradoc/groups/public/documents/APCITY/UNPAN015416.pdf>  
[http://www.bk21.or.kr/datas/english\\_ver.htm](http://www.bk21.or.kr/datas/english_ver.htm)

<sup>4</sup> [http://www.kosef.re.kr/english\\_new/programs/programs\\_01\\_04.html](http://www.kosef.re.kr/english_new/programs/programs_01_04.html)

<sup>5</sup> <http://www.jsps.go.jp/english/e-21coe/index.html>

<sup>6</sup> <http://www.jsps.go.jp/english/e-globalcoe/index.html>;

<b>European Commission, Framework Programme 7 (FP7)</b> <sup>7</sup>	TBD – determined by structure of Research Proposals (RFPs)	Based on number of RFPs with a “centre of excellence” structure The overall FP7 budget is EUR 50.5 Billion covering 2007-2013 <sup>8</sup>	Launched in 2007 2007-2013
<b>China 211 Project</b> <sup>9</sup>	100 higher education institutions	\$18 billion in 7 years (\$400M to funding World Class Research Departments)	Launched in 1996
<b>China 985 Project</b> <sup>10</sup>	34 research universities	28.3B Yuan	1999 – 2001
<b>Chinese Academy of Sciences (CAS) Institutes</b> <sup>11</sup>	Mathematics and physics 15 Chemistry and chemical engineering 12 Biological sciences 20 Earth Sciences 19 Technological sciences 21 Others 2		
<b>Canada Networks of Centers of Excellence</b> <sup>12</sup>	23 currently funded Networks of Centers of Excellence 16 previously funded Networks	C\$77.4 million per year since 1999 C\$47.3 million a year in 1997-1999 C\$437 million in total in 1988-1998	Operating since 1988 Permanent program since 1997
<b>UK Funding for Excellent Units</b> <sup>13</sup>	Universities with the highest marks after the Research Assessment Exercise	\$8.63 billion disbursed after 2001 RAE	5 years for Research Council funded Centers <sup>14</sup>

[http://www.jsps.go.jp/english/e-globalcoe/data/application\\_guidelines.pdf](http://www.jsps.go.jp/english/e-globalcoe/data/application_guidelines.pdf);

[http://www.jsps.go.jp/english/e-globalcoe/data/review\\_guidelines.pdf](http://www.jsps.go.jp/english/e-globalcoe/data/review_guidelines.pdf)

<sup>7</sup> <http://ec.europa.eu/research/era/pdf/centres.pdf>

<sup>8</sup> [http://cordis.europa.eu/fp7/what\\_en.html#funding](http://cordis.europa.eu/fp7/what_en.html#funding)

<sup>9</sup> <http://unpan1.un.org/intradoc/groups/public/documents/APCITY/UNPAN015416.pdf>

<sup>10</sup> <http://www.oecd.org/dataoecd/9/45/37800198.pdf>

<sup>11</sup> [http://www.itps.se/Archive/Documents/Swedish/Publikationer/Rapporter/Arbetsrapporter%20\(R\)/R2007/R2007\\_001%20FoU-finansiarer.pdf](http://www.itps.se/Archive/Documents/Swedish/Publikationer/Rapporter/Arbetsrapporter%20(R)/R2007/R2007_001%20FoU-finansiarer.pdf)

<sup>12</sup> <http://www.nce.gc.ca/>

<sup>13</sup> <http://www.hefce.ac.uk/research/funding/>

<sup>14</sup> <http://www.rcuk.ac.uk/research/resfunding.htm>

			Two rounds: 1996 and 2001  2008 RAE Scheduled <sup>15</sup>
<b>Chile Millennium Science Initiative</b> <sup>16</sup>	Groups of Researchers:	3 Science Institutes: \$1 million a year for 10 years; 5-12 Science Nuclei: \$250 thousand a year \$25 million in total in 2000-2004	Every 5 years for nuclei and every 10 years for institutes
<b>Denmark (Globalization Fund)</b>	Funds to be allocated to research universities on a competitive basis	\$1.9 billion between 2007 and 2012	Launched in 2006
<b>NEPAD / Blair Commission for Africa (Proposed)</b> <sup>17</sup>	1) Revitalise Africa's institutions of higher education  2) Develop centres of excellence in science and technology, including African institutes of technology	1) US\$500 million a year, over 10 years  2) up to US\$3 billion over 10 years	
<b>Taiwan Development Plan for University Research Excellence</b> <sup>18</sup>	Selection and financial support of internationally leading fields	\$400M	4 years

Elaborated by Natalia Agapitova, Michael Ehst and Jamil Salmi (last update 9 March 2007)

<sup>15</sup> <http://www.rae.ac.uk/>

<sup>16</sup> <http://www.msi-sig.org/msi/current.html>

<sup>17</sup> <http://www.eurodad.org/articles/default.aspx?id=595>

<sup>18</sup> <http://unpan1.un.org/intradoc/groups/public/documents/APCITY/UNPAN015416.pdf>

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