Chapter 14
Frameworks for Creating Research Universities: The Hong Kong Case

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14.1 Background

Hong Kong has long been viewed as a trading port driven by a market economy (Tsang 2004). One English medium university sufficed for over 50 years. Mass schooling led to the establishment of a Chinese medium university in 1963. The two universities became training grounds for civil servants, professionals, and urban elites. By 1981, only 2% of the relevant age group gained access to a university place. Access grew to 8% by 1989, when an outflow of professional talent due to upheaval on the Chinese mainland led to a decision to double university places. The number of universities increased to eight by 1997. By 2006, 60% of the 17–20 age cohort had access to postsecondary education, but largely though self-financed community college places. In 2010, Hong Kong had 12 degree-granting institutions. In 2013, the traditional British $3 + 4 + 3$ education system was changed to a $3 + 3 + 4$ structure (3 years of junior and 3 years of senior secondary education followed by a 4-year university system) (EMB 2005). Competition among institutions of higher education for the best students is intense at times. However, incentives have been introduced to encourage cross-institutional collaboration as a way of strengthening areas of teaching and research (Sutherland 2002).

Knowledge economics and financial retrenchment has shaped policy discourse about higher education. A 2004 report by the University Grants Committee of Hong Kong entitled *To Make a Difference: To Move with the Times* stated:

> Human capital is the single most important asset of Hong Kong. We need home-grown graduates who have a strong sense of belonging, and a strong sense of identity as being a part of Hong Kong. At the same time it is also important to nurture a core of local faculty who

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> give stability, local character, and cultural and intellectual rootedness to local universities, and engage themselves heavily with the local community. (University Grants Committee 2004).

14.1.1 Economic Drivers

Capitalism remains a sacred part of the Hong Kong's way of life. Mainland China's transition to a market economy has reinforced Hong Kong's economic philosophy and its new effort to link university improvements to the marketplace. Beijing, Shanghai, and Guangzhou compete with Hong Kong to be China's economic powerhouse. Therefore, educational reforms in Hong Kong have taken on a new urgency.

> . . . If recently launched educational reforms have the intended effect of producing a more flexible, creative, and skilled workforce, Hong Kong will have a fighting chance to keep its vaunted position as China's international window over a longer time period (Panitchpadki and Clifford 2002).

Since the turn of the Century, Hong Kong has imported a more managerial-entrepreneurial model of higher education. Other drivers affect Hong Kong higher education, such as the transfer of manufacturing to the Chinese mainland and a transition to a knowledge-based service economy. By offering internationally competitive salaries, Hong Kong's universities have been able to recruit top talent from overseas.

14.1.2 National Academic Cooperation

Hong Kong has long been a bridge for sending students overseas for higher education. The first Chinese to study overseas was Yung Wing, who attended the Hong Kong's Morrison Education Society School before earning a degree from Yale University in 1854. (Ting and Pan 2003). The first group sent to America in 1872 included those who attended school in Hong Kong. Dr. Sun Yat-sen, the Father of Modern China, studied in Hawaii and later at the Hong Kong Medical College (later to become the University of Hong Kong). Throughout the rest of the twentieth century, thousands followed, including Nobel laureate Daniel Chee Tsui, a graduate of Hong Kong Pui Ching Middle School. The reform on the Chinese mainland that began in 1978 affected Hong Kong's position as the bridge for China's educational exchange with Western universities. In order to adapt, Hong Kong capitalized on its unique capacity to operate bilingually and biculturally.

The Chinese mainland's economic reforms have strengthened Hong Kong's innovative capacity. Hong Kong shifted from a traditional role of being an academic bridge to being an international hub for higher education services. Finally, Hong Kong has been involved in the Chinese mainland's transition from elite to mass

higher education and the Chinese mainland's aspiration for its top universities to achieve world-class status.

Hong Kong benefits greatly from robust university growth on the mainland. The proximity to and unique relationship with mainland universities will become instrumental to enhancing Hong Kong's global competitiveness. China is pushing ahead to create "world-class" universities. As university presidents from around the world visit Beijing and Tsinghua Universities, they cannot help noticing the tremendous sums of money being funneled into modernizing these campuses. They will also hear a great deal about new measures to raise academic quality. Yet, mainland universities need more in the software that characterizes an advanced academic culture focused on research, collaborative work, meritocratic advancement, and top-quality teaching and advisement.

The culture of academic management in Hong Kong's universities has important advantages that go beyond impressive facilities. The University of Hong Kong (UHK) has undergone a major expansion and renovation of its campus to work its 100th anniversary and prepare for its new four year program. But it is in the software of academic culture and traditions—where Hong Kong's top universities have a competitive advantage. These include predominant use of English in higher education instruction and as well as continually raising the standard of Chinese. Academic freedom is well entrenched and has withstood several major challenges in the last two decades. An international faculty has not been sidelined in the day-to-day operation of the universities and compliments the cosmopolitanism of the local staff and their institutions. Transparency is valued and academic staff are involved in planning and key decisions. Working conditions are favorable by international standards, as are academic salaries—despite quickly sliding downward toward the international norms with several cuts in recent years. A performance-based system guides decisions about resources and promotions.

While permanent tenured academic appointments are highly competitive and difficult to obtain in Hong Kong, there is a recognized academic career path and reasonable security of employment. Perhaps most important is the fact that both Hong Kong's universities and its society function according to accepted international standards and have a general commitment to excellence, meritocracy, and an openness to ideas and innovations.

There is a perspective that the main requirement for Hong Kong to maintain its competitive academic system is for society at all levels—including the universities themselves as well as the government and the public—to support the universities and recognize them as a central element of Hong Kong's competitive future. This means both adequate funding as well as attention to maintaining and strengthening Hong Kong's distinctive academic culture. An environment in which the most creative professors can pursue their work is essential. It was pointed out during Steven Hawking's visit that scientists' deference to authority can be a hindrance to scientific breakthroughs. Many mainland Chinese academics are still at the crossroads, stuck between the old traditional bureaucratic control and the new forces of global corporate university culture. But, it will not be that way forever as social change continues in China.

Specific policy initiatives include joint programs of academic cooperation and exchange, internationalization in student recruitment, the continued use of English as language of higher education, an emphasis on academic and professional fields especially relevant to Hong Kong's competitive future, dedication to intellectual freedom that have been a hallmark of higher education in Hong Kong, attracting Hong Kong overseas scientists to return home, continued reform of the school system, an undergraduate curriculum that builds problem-solving skills, commitment to community building, and a research culture that is supported with bold initiatives to sustain a new intellectual environment of discovery and application.

14.1.3 Contexts and Characteristics

It is reasonable to ask how Hong Kong, as special administrative region of China, has more highly ranked research universities than any city in China or elsewhere in the world. There appear to be several determining factors as to why three of its research universities are high in the global rankings, and every one of the other public universities is academically respectable. For example, the Times Higher Education placed the University of Hong Kong (UHK) 34th, the Hong Kong University of Science and Technology (HKUST) 61st, and the Chinese University of Hong Kong (CUHK) 151st in the 2011 global rankings. Meanwhile, Mainland China's Peking and Tsinghua Universities are rank 49th and 71st. The Academic Rankings of World Universities (ARWU) introduced a greater China ranking and has Hong Kong's three top universities at number 3, 5, and 6. In this ARWU ranking, only Tsinghua University in Beijing and Taiwan University in Taipei place higher than UHK, HKUST, and CUHK. In fact, these three are not large by international standards and enroll only 10–20,000 students each. Their sates of establishment are far apart with UHK in 1911, CUHK 52 years and HKUST 90 years later. All are public universities, which although receiving support from government, also charge students a relatively modest amount of tuition. About 80% or more of the undergraduate students are drawn from Hong Kong itself, a tiny region of 1095 km^2 (423 sq. miles).

Nevertheless, there are obvious reasons for success of Hong Kong's universities. Although they were under colonial rule until they become part of the People's Republic of China in 1997, they enjoy more institutional autonomy and academic freedom than almost anywhere else in this part of the world. When the economy is strong, government investment is more generous. However, during economic downturns, academic salaries are cut. Moreover, academics are now expected to take a major role in writing research grants and attracting donations to their universities. Hong Kong's tilt toward a heavy emphasis on research took shape with the approach of the 1990s when the four Asian tigers (Hong Kong, Singapore, South Korea, and Taiwan) were the most dynamic areas of Asia. Even though the Hong Kong government left investment in high tech to the private sector, it was willing to

establish a science and technology university as infrastructure for upgrading its economy. This period also corresponded with an era of massification in higher education in many parts of the world. The enlargement of the undergraduate population provided a base for starting to build capacity in its graduate schools and research centers, contributing to a much more diversified system of higher education.

14.2 Three Key Factors: Governance, Internationalism, and Academic Leadership[1]

Governance. Hong Kong's government, through the Research Grants Council and the University Grants Committee, steers the higher education sector by prioritizing funding, setting broad guidelines on performance. Beyond this, the universities are virtually autonomous in other respects and manage their affairs as they see fit. The University of Hong Kong is rooted in the British academic tradition. The Chinese University of Hong Kong, established by the consolidation of New Asia College, Chung Chi College, and United College in 1963, brought traditional American missionary and Chinese traditions into Hong Kong's colonial framework for higher education. The Hong Kong University of Science and Technology added an American research university model and academic governance to the mix, without assaulting the status quo. All three have instituted systems of international governance arrangement standards. This places control by the academics in high regard. However, they also value strong administrative leadership, with an emphasis on fairness and efficiency.

Shared governance seems to work well in Hong Kong, although all three of the universities have somewhat different approaches to it. The universities neither become bogged down in endless academic bickering nor become ruled by autocratic administrators. Academic staff unions are relatively weak. Unlike in the US system, university decisions about tenure and promotion are seldom if ever legally contested in the public courts outside of the university. The differences between the British style University of Hong Kong and the more American-oriented managerial style of the Hong Kong University of Science and Technology have begun to fade as they each have taken a pragmatic view and adopted aspects from each other's governance model.

Internationalism. Hong Kong's internationalism has shifted slowly away from a total focus on the United Kingdom, Australia, and North America to include more academics from the Chinese mainland and a small but increasing number of top academics from every continent. Hong Kong is the Asian headquarters for

[1]Parts of this section appear in Chinese within the **Peking University Education Review** (in press).

many multinational companies and is one of the top three (after New York and London) international banking centers. Although its population is 95% Chinese, an international cosmopolitan spirit pervades. Most of the top academics at research universities have overseas doctorates, and many remain mobile and move to academic and administrative posts in overseas universities. The universities place a high value on seeing themselves as international institutions, even though they have grown closer to the Chinese mainland in the past decade and a half.

Nowhere else in Asia can one find better access to international scholarship, including high profile professorial visitors, books, journal publications, and all other forms of open media. There is no censorship of the Internet and no censorship of academic books, even though they may be restricted on the Chinese mainland or elsewhere in Asia. International academic events—forums, seminars, and conferences—on a caliber of anywhere in the world occur on a daily basis. Internationalism is helped along by the universities' maintenance of English as the medium of instruction (although both English and Chinese (the Cantonese dialect but also Mandarin) are used at the Chinese University of Hong Kong to reflect its name and intellectual heritage). This ensures that Hong Kong's universities remain within the mainstream of global science and scholarship. The academic community remains wedded to publishing in international academic journals which are produced in English, although in recent years, Chinese publication has increased as Hong Kong academics have begun to take advantage of the impact won by publishing in the massive academic landscape on the Chinese mainland.

Academic leadership. Without question, the success of Hong Kong's universities rests largely with its academic leadership. Academics are relatively well respected. While no longer the highest-paid academics in the world, salaries compete globally, and Hong Kong is able to recruit some of the best academic minds in the world. The universities ensure that top drawer scholars and scientists, including Nobel laureates, are invited to lecture. Ample support is provided for the professoriate to remain active at international conferences throughout Asia, Australia, Africa, Europe, North and South America. Conditions of academic work—including teaching loads, administrative support, and the availability of research funding, on a competitive basis from local sources—are all globally competitive. Leaders in academic fields play a role in external assessment of research grant applications and in external assessment of all teaching programs and doctoral dissertations. Academic recruitment is done internationally, and promotion and tenure are performance based and quite competitive. This has contributed to the productivity of the professoriate. More recently, Hong Kong has taken advantage of the well of talent among the thousands of young mainland Chinese scholars who studied overseas and have not yet returned to China. Many are recruited to universities in Hong Kong where they can live in a Chinese environment, while at the same time enjoying competitive salaries and working conditions—superior in many cases to what is available on the Chinese mainland. More importantly, Hong Kong offers mainland returnees an atmosphere that has a free flow of information, is less encumbered by bureaucracy, and where academic governance is more participative and transparent. The second international

survey of the academic profession revealed that the academic profession in Hong Kong, more than elsewhere, views personnel matters and resource allocations to be largely made on the basis of performance measures.

Faith among the academic profession in Hong Kong has also hinged on the academic caliber of its institutional leaders. Each of the three research universities has ensured that only outstanding academics would be at the helm of their institutions. This has undoubtedly had a great deal to do with the rise of Hong Kong's universities in the international rankings. For example, the last president of the University of Hong Kong is a world-renowned geneticist, and the president of the Chinese University of Hong Kong was awarded a Nobel Prize for his work in fiber optics and current president named "Asian Hero" by the *Time* magazine in recognition of his outstanding contributions fighting SARS. The current president of the Hong Kong University of Science and Technology distinguished himself as a key assistant director of the US National Science Foundation, in charge of the Mathematical and Physical Sciences Directorate. There may be other considerations in the selection of university leaders. However, to sustain its rise in the global rankings, Hong Kong must ensure that the most significant aspects are that the most respected global scholars and scientists are the ones that are in positions of authority at their universities.

14.2.1 The Case of HKUST

The Hong Kong University of Science and Technology (HKUST), founded in 1991, has risen rapidly in the global ranking by attracting top tier academics to the university. This university awards degrees in five schools organized under the academic affairs of the university. The Schools of Science, Engineering, and Business and Management offer undergraduate and postgraduate programs through to the doctorate. The School of Humanities and Social Science provides general education for all undergraduates and enrolls graduate students up to the doctoral level. In 2009, it had about 10,000 students and 500 teaching staff (Table 14.1).

According to Hazelkorn (2009), world-class universities are publicized as a symbol of national pride and used as an indicator of economic dynamism to encourage investment. Altbach (2004) notes the WCU paradox, that "everyone wants one, no one knows what it is, and no one knows how to get one." No direct measure was available to define the superior status of universities in terms of training of graduates, research output, and technology transfers. Nevertheless, the WCUs are said to produce well-qualified graduates who are in high demand on the labor market, conduct leading-edge research published in top scientific journals, and contribute to technical innovations through patents and licenses (Khoon et al. 2005; Niland 2000). Alden and Lin (2004) added the criterion of the university's contribution to society. Gallagher (2011) divides WCU characteristics into inputs and outputs. The inputs include the quality of students they attract, the expertise of academic faculty and administrative staff, the depth of research capability,

Table 14.1 Students and academic staff of HKUST (2009)

	Students			Academic staff		
	Undergraduate	Postgraduate	Total	Regular	Visiting	Total
Science	1,433	509	1,942	102	19	121
Engineering	2,270	1,347	3,617	152	19	171
Business and management	2,149	1,160	3,309	118	15	133
Humanities and social science	N/A	285	285	50	8	58
UG dual degree programs	117	N/A	117			
Total	5,969	3,302	9,271	422	61	483

Source: HKUST website

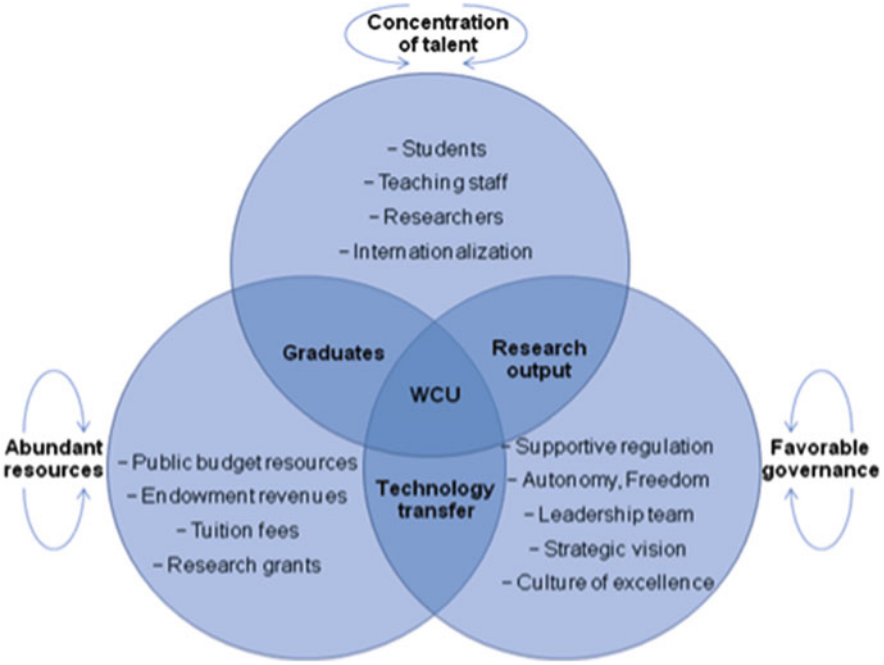

Fig. 14.1 Alignment of key factors (Salmi 2009)

institutional assets, revenue diversity, and costs. Outputs inlcude graduates who take up leadership roles in the professions, business and public service, and high-quality research. Marginson (2011) pointed out the ambiguity of term WCU and suggested Global Research University. GRU experiences three phases: First, institutions build the "capacity" to operate globally. Second, they focus on improving global "connectivity." Third, they do global "activity." In this chapter, the key dimensions of HKUST can be viewed according to Salmi's (2009) categorization (Fig. 14.1).

14.2.1.1 Concentration of Talent

HKUST's most important success factor was the recruitment of outstanding talent. All academic staff had doctorates, and at least 80% had doctorates or had worked at recognized world-ranked universities: Caltech, Imperial, Stanford, Toronto, Cambridge, London, Carnegie-Mellon, Michigan, Chicago, MIT, UC Berkeley, UCLA, Columbia, Northwestern, Cornell, Oxford, Washington, Wisconsin, Harvard, Princeton, Illinois, Purdue, Yale, and UBC. This is not only an indication of quality, but it also represents a wellspring of academic capital that is used to build transnational research collaborations among networks of scholars from similar institutions. HKUST was able to recruit high-quality academic staff for several reasons (Postiglione 2011).

14.2.1.2 Abundant Resources

Like other universities in Hong Kong, HKUST's funding comes from diverse sources—government budget funding for operational expenditures and research, contract research from public organizations and private firms, financial returns generated by endowments and gifts, and tuition fees. Considering that the R&D budget for Hong Kong is only 0.7% of GDP, placing Hong Kong in the 50th position in global rankings for this indicator, the amount of research funds available to HKUST could be considered substantial. In fact, research funding levels have steadily increased (Table 14.2).

As philanthropy continues to grow in Chinese societies, donations will come to play an increasing role in the finance and development of Hong Kong higher education, especially for universities with a long history and thousands of alumni, like the University of Hong Kong. Starting off as the only university in Hong Kong without an alumni sector, HKUST took advantage of the timely rise of Chinese philanthropy. The Hong Kong government facilitated the donation culture by providing matching grants to donations made to universities. The following donations were publicized when given to HKUST: Sino Group $20 million, Kerry Group $20 million, Shun Hing Group $10 million, Shui On Group $25 million, and Hang Lung Group $20 million. By agreement with the donors, the donation amounts from the following donors were not disclosed: Hang Seng Bank, Hysan Trust Fund, and Li Wing Tat family. There were also donations of equipment from IBM and JEOL. All of these donations quoted above were made during HKUST's early development stage. During its 10th anniversary, HKUST noted that it received substantial contributions from 18 foundations and 19 corporations, as well as 7 individual and family donors (Table 14.2).

Top universities show the success of their faculty in competing for government research funding. If the number of grants per academic staff is calculated, HKUST has a higher success rate on competition for government research grants than other universities.

Table 14.2 HKUST Research Funding by source 2001–2010 in HK$ Millions (%)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Block grant	3.9 (1.6)	6.0 (3.5)	16.9 (5.5)	23.1 (11.3)	18.1 (7.7)	14.3 (6.5)	25.1 (9.9)	73.4 (27.8)	77.2 (20.3)	52.7 (16.2)
Other UGC grants	0.6 (0.2)	20.3 (11.8)	17.3 (5.7)	25.7 (12.6)	18.1 (7.7)	3.3 (1.5)	18.3 (7.2)	10.4 (3.9)	73.3 (19.3)	16 (4.9)
RGC direct	8.3 (3.3)	8.7 (5.1)	9.7 (3.2)	10.0 (4.9)	8.6 (3.7)	7.8 (3.6)	6.4 (2.5)	8.9 (3.4)	7.5 (2.0)	7 (2.2)
Other RGC grants	95.2 (38.1)	94.0 (54.7)	114.0 (37.4)	103.7 (50.7)	98.6 (41.9)	96.1 (44.0)	116.6 (46.1)	114.8 (43.5)	108.7 (28.7)	133.3 (41.0)
Other sources	141.8 (56.8)	42.8 (24.9)	146.8 (48.2)	42.1 (20.6)	91.9 (39.1)	96.9 (44.3)	86.6 (34.2)	56.6 (21.4)	112.8 (29.7)	116 (35.7)
Total	249.8 (100.0)	171.7 (100.0)	304.8 (100.0)	204.6 (100.0)	235.3 (100.0)	218.5 (100.0)	253.1 (100.0)	264.0 (100.0)	379.4 (100.0)	325 (100.0)
Wage amount project HK$'000	589	436	643	433	567	533	594	650	795	713

Source: UGC(2001–2010) Annual Statistics, Research Projects, http://cdcf.UGC.EDU.hk/cdcf/STATINDEX.DO?lANGUAGES=EN.
Note: Figures may not add up to the corresponding totals due to rounding.

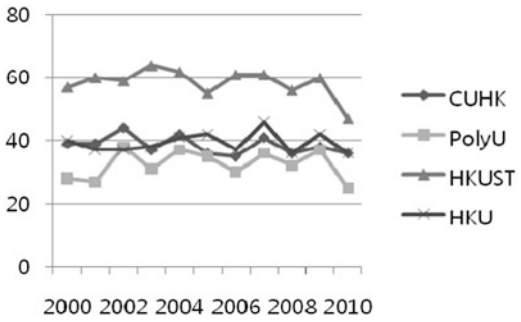

Fig. 14.2 Number of applications supported (success rate, %) (Note: *CUHK* The Chinese University of Hong Kong, *Poly U* The Hong Kong Polytechnic University, *HKUST* The Hong Kong University of Science & Technology, and *HKU* The University of Hong Kong). Source: http//www.uge.EDU.HK/eng/Rgc/RESULT/gRF/gRF.htm

14.2.1.3 Favorable Governance

Strategic Vision and Goals

To be able to develop an appropriate vision for the future of the university and to implement this vision in an effective manner, the leaders needs to understand the core agenda of the institution and be able to apply the vision with the necessary operational skills. Vision setting will consist of delineating the main areas where the institution wishes and has the potential to operate at the forefront (Salmi 2009).

Before HKUST, Hong Kong had functioned with two elite universities, one English language medium and one Chinese language medium. A third university had to be justified more than on the basis of student demand. HKUST espoused the maxim "create, don't replicate" and emphasized that it was "designed to be different." These twin maxims had the effect of emphasizing the importance of being unique at a time when Hong Kong still viewed the universities as elite institutions. Moreover, HKUST professes to become a "leading force in higher education," "a global academic leader," "an agent of change," and "a catalyst for significant progress in science and technology research and education in Hong Kong, and the Mainland." This coincides with Salmi's assertion that a world-class research university "should be based on a forward looking vision that is genuinely innovative" (2009).

External Governance

If a new research university is to be established and nested within a particular model of higher education, and the system provides enough autonomy to permit it to develop its particular edge over other long established institutions of the system by innovating in its governance or academic structure in accordance with a unique

vision, this is a potentially valuable advantage. It also represents a systematic way to speed up the process of introducing reforms in other top institutions, whose ethos and long history prevent any radical changes that would be risky to the identity and long established brand of the university.

The factor contributing to HKUST's innovative character was the highly autonomous nature of higher education in Hong Kong. Although HKUST has been a public institution from the start, it is autonomous in most respects. It can innovate without having to receive approval by government or the UGC, and it is not required to adhere to conventions followed by the other two government universities, although it may be in its interest to adhere to conventions concerning recruitment of students. In fact, the University of Hong Kong and Chinese University of Hong Kong had operated differently, one with a 3- and the other with a 4-year bachelor degree program for many years, although they eventually standardized in order to lighten the examination pressure on secondary school students who had been taking two rather than one university entrance examination.

Internal Governance

A key innovation of HKUST that contributes to its maxim "be unique and not duplicate" is the manner in which administrators are chosen (Woo 2006). All deans would be appointed rather than, as was the case in the other universities of Hong Kong, be selected or elected from within a school or faculty. While this is the modus operandi at top American universities, it is innovative within the context of Hong Kong. At the time, Hong Kong had a system that adhered closely to the British model of higher education.

HKUST was being established during the sunset years of the British administration and at a time when the United States and Mainland China were Hong Kong's major trading partners. Not only were most major universities in the world located in the United States, but the higher education system in Mainland China operated more closely to the American model of higher education, and most of China's prospective academics who studied overseas did so in the United States. This gave HKUST a tremendous advantage. In short, to be unique, HKUST merely had to adapt innovations from the American university system. British higher education was closely guarded and protected, creating inertia to change. Thus, the timing of its establishment, something that may be difficult to duplicate elsewhere, mattered a great deal to its rapid rise.

Collaboration and Partnership

HKUST's collaborations, partnerships, and internationalization have contributed to its success (Ji 2009). Under the Hong Kong Area of Excellence scheme in research, HKUST has collaborative project with other leading universities in Hong Kong in the following areas: Chinese Medicine: Research and Further Development (with

CUHK), Institute of Molecular Technology for Drug Discovery (with HKU), Centre for Marine Environmental Research and Innovation Technology (with CUHK), Developmental Genomics and Skeletal Research (with HKU), and Control of Pandemic and Inter-Pandemic Influenza (with HKU).

HKUST has a Research and Development Corporation (RDC) for partnerships and knowledge transfers with industry. RDC partnerships and other HKUST academic partnerships include but extend far beyond Hong Kong itself. For example, HKUST, Peking University, and the Shenzhen Municipal government established a tripartite cooperative institution that engages in production, study, and research. It helps to commercialize high-tech research products. With an $800M donation, HKUST established a Nansha Graduate School in Guangdong Province to promote scientific cooperation between Hong Kong and the Chinese mainland. HKUST also has a partnership in Beijing's financial district under a tripartite agreement to establish an International Financial Education and Training Center in Beijing with Beijing Financial Street Holding Co., Ltd. and Beijing International Financial Center (Liu and Zweig 2009).

14.3 Building World-Class Universities: Government Frameworks

Research universities play a critical role in training the professional, high-level specialists, scientists, and researchers needed by the economy and in generating new knowledge in support of national innovation system (World Bank 2002). Therefore, many governments are trying to make sure that top universities are actually operating at the cutting edge of intellectual and scientific development. Policy makers and university leaders search for strategies and pathways, often borrowed, for establishing such universities and identify the challenges, costs, and risks. They have developed diverse strategies, some innovative and progressive, others copying policies elsewhere, whether relevant or not. In the case of Hong Kong's autonomous universities, becoming WCUs could not be accomplished without a favorable policy environment to permit individual institutions with respected academic leaders, clear mission and goals, strategic planning, and supportive internal environment for academic staff development to translate the institutional vision into concrete targets and programs.

14.3.1 Establishment of WCUs

Salmi (2009), according to governments have to consider upgrading a small number of existing universities that have the potential to excel, merge, and consolidate existing institutions or establishing new ones. In the Hong Kong case, both existing

and new institutions were supported. Rather than using a conventional strategy of concentrating resources in one or more already established flagship institutions, Hong Kong used a strategy for creating research universities in which universities complement one another and thereby strengthen the entire system's research capacity.

14.3.2 Specific-Purpose Program

Some Asian governments have launched initiatives such as COE Program (Japan), 211 and 985 programs (China), and Brain Korea 21(South Korea). In order to provide incentives for elite institutions to focus on research excellence, governments may provide specific funds. This approach is more likely to produce differential outcomes when allocations for different funding streams, whether reward-based or improvement-based, are limited to a few rather than shared among all institutions.

It is somewhat remarkable that Hong Kong has not launched any official government policy or initiative strategy to establish representative world-class research universities. However, government has increased funding for research at a continual pace and has successfully employed a competitive-based allocation system among the universities. It was not until 1991 that the government accepted the advice of the UGC to establish a Research Grants Council (RGC) with annual funding of $100 million. Since then, research finding has grown considerably. A significant amount is identified by universities from UGC/RGC funds for research (approximately $4.5 billion per year), and the RGC now disburses about $750 million per annum for research projects. The Innovation and Technology Fund of the government is projected to spend $ 1.0 billion on R&D in 2010/2011, having been spending from $400 million to $800 million per year in the recent past (UGC 2010a).

14.3.3 Performance-Based Funding

Hong Kong's performance-based funding approach reflects a view that institutions should be funded, not for what they are, but for what they do. They are typically related to a set of quantitative indicators measured over intervals of time, and funding flows in accordance with improvements in the measures. They may be used to encourage some institutions to expand their level of activity in particular areas. Their effectiveness in promoting differentiation depends on clarity of purpose and the selections of indicators.

In case of Hong Kong, with the increase of funding to RGC from the Research Endowment Fund, it is inevitable that its mode of functioning and organization will change. The RGC is rising to the challenge with the Theme-based Research Scheme and the Public Policy Research Initiative. The UGC's view is that this mode will reassure institutions with different roles and strengths that their needs are being

properly addressed and this mode will also permit them to differentiate themselves more effectively (UGC 2010a). At present, the RGC's work is assisted by four specialist subject panels, responsible for Physical Sciences, Engineering, Biology and Medicine, and Humanities, Social Sciences, and Business Studies.

14.3.4 Quality Assurance

Quality assessment is concerned with outcomes and how good they are. In terms of research, assessments may affect eligibility for funding of doctoral students or participation in particular programs. In spite of small size of Hong Kong higher education, there are three different bodies (HKCAAVQ, Joint Quality Review Committee, and the Quality Assurance Council) responsible for the quality assurance of different higher education institutional providers. UGC is trying to integrate three bodies to make single system for quality assurance, and in the process increase transparency so as to permit better-informed choices by consumers (UGC 2010a).

14.4 Conclusion: Concerns About the Asian Race to Build WCUs

The competition for world-class status in some countries has fused national and institutional priorities and transformed global rankings from a benchmarking tool into a strategic instrument.

The endeavor to build WCUs can have some positive benefits by helping universities identify targets and actions and monitor peer performance and public comment (Hazelkorn 2009). The flipside—the tendency toward gaming the system is far less positive (Ishikawa 2009). By doing so, the distinctiveness of individual institutions becomes submerged as the game becomes one of attaining a standardized set of characteristics that are said to characterize WCUs (Cohen and March 1974; Reale and Seeber 2011).

Few societies or institutions can afford the level of investment required for WCUs without sacrificing other social and economic objectives such as widening access, institutional diversity community partnerships, cross-institutional collaboration, and resource sharing and knowledge transfer (Usher and Savino 2006; Hazelkorn 2008a). Therefore, asian WCUs may tend to inflate the academic "arms race" as the WCU quest pulls in more and more countries. The downside effect of this competitive pursuit of academic prestige can end up being a costly, zero-sum game in which resources, including administrative and faculty attention, gets diverted away from the collective action necessary to improve student learning. Indeed, most input indicators have an irrelevant or very small effect on student's learning. How much students grow or change has only an inconsistent or trivial relationship with

such input measures as educational expenditures per student, student/faculty ratios, faculty salaries, percentage of faculty with highest degree in their field, research productivity, size of library, admission selectivity, or prestige rankings (Dill 2006).

For the Hong Kong case, societal context and institutional autonomy matter as much as government policy. Universities are able to capitalize on knowledge about local, national, regional, and global changes. While government plays a macro steering role in terms of overall finance and alignment with other sectors of growth in economy and society, it does not institute specific policies driven by global university rankings. Universities can introduce initiatives without consulting government. Unlike the Chinese mainland where special note was taken of the nominal position of their universities when the global university ranking scales became popular at the tail end of the twentieth century, Hong Kong's top three research universities were more concerned with maintaining their high ranks rather than instituting major reforms to jack up their global standings.

The case of the oldest and newest research universities (HKU and HKUST) provides examples of how universities with highly differentiated academic cultures and formats of governance can operate within a system of public universities, avoid unhelpful standardization of operating procedures, and continue to excel on the basis of their unique characteristics without assaulting each other's academic traditions, all the while learning from each other and adapting useful innovations. Likewise for the Chinese University of Hong Kong which has a unique tradition of maintaining Chinese language medium instruction for a significant amount of its curriculum, yet, it remains integrated into the global academy where English scientific journals lead the advancement of knowledge. CUHK plays a key role in helping to lead thinking about how Hong Kong Chinese academic culture resonates with national academic culture.

The case of HKUST is particularly valuable because it demonstrated that in broad terms, vision was as important as finance and in recruitment of top talent, national sentiment was as important as salaries. The leadership of the new institution was not only able to identify the advantageous conditions that existed at the time but to take advantage of them in ways that were highly effective. In HKUST's case, drive and commitment cannot be discounted as key factors. It situated itself within an almost alien academic culture without assaulting the host academic ethos. British and American academic traditions discovered grounds for integration like nowhere else in the world.

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