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Emerging education hubs: the case of Singapore

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Abstract In anticipation of a globalising post-Fordist political economy, countries and universities are increasingly pursuing strategic transnational education and research alliances. This article analyses the Global Schoolhouse, a key education policy platform that aims to transform Singapore into a knowledge and innovation hub by establishing networks and collaborations with foreign universities. Two Global Schoolhouse initiatives are examined—the alliance between Singapore and MIT (Massachusetts Institute of Technology), and the institutional restructuring aimed at re-modelling the National University of Singapore into a 'leading global university centred in Asia'. We outline some of the complexities and unanticipated outcomes which emerge when nations and their education institutions seek to globalise.

Keywords Globalisation · Internationalisation · Knowledge economy · Singapore · Entrepreneurial university · Higher education

Introduction

Singapore has long privileged the contribution of education towards national economic development. During the post-independence era its universities were steered towards cultural and institutional identities which resonated with its nation-building agendas. Today, Singapore's universities are expected to embrace new nation-building roles by

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contributing to a development agenda that seeks to re-model the city-state into a knowledge based economy. Given this context, the research capacity of its universities, like those of other middle and high income countries, is assuming a new and unparalleled significance in political and economic discourse (see Marginson 2007). As we show in this paper, Singapore draws heavily on foreign expertise and alliances with foreign universities to acquire leading edge innovative capacity and talent. These efforts have been well resourced by a government anxious to propel the country's universities into 'world class' status so as to further its aspirations to become a knowledge and education hub. Although its universities continue to place importance on labour force education and training, they are also intensifying efforts to produce qualities of entrepreneurialism, creativity and cosmopolitanism in their graduates, in keeping with several state-driven policy platforms.

The paper is organised as follows. In the next section ("Singapore in the global economy"), we describe Singapore's political economy, and the role of hub/cluster economic development in informing its knowledge based aspirations. We then proceed in "Methods" to discuss the methods that informed this research before going on in "Policy in practice" to examine the implementation of this policy in practice through two cases. These are: the collaborative alliance between Singapore and the Massachusetts Institute of Technology, and the reformation of the National University of Singapore into a 'Global Knowledge Enterprise'. We conclude in "Conclusion" with a discussion of mutations in the Global Schoolhouse from a platform initially formulated to emulate the US paradigm of research based cluster development to potentially new expressions of transnational education and research which are grounded in the growing geopolitical significance of Asia.

Singapore in the global economy

By forging a development blue print aimed at to servicing global capitalism, Singapore's ruling party, the People's Action Party (PAP), embraced an industrialization plan driven by foreign investment (Clark and Kim 1995; Perry et al. 1997, pp. 48–49). This approach to development enabled the city-state to acquire manufacturing capabilities and provided employment for its working classes, and lead to a dramatic reduction in poverty, a significant achievement in a region still challenged by inequality. However, it also contributed to a failure to develop indigenous entrepreneurs and corporations with global profiles and reach such unlike Japan and Korea. The policy of integrating Singapore into the global value-chains of foreign multinational corporations (MNCs) meant that Singapore did not develop 'national champion' enterprises like those exemplified by the Toyotas, Sonys, Acer and Samsungs (Lim 2006).

By the end of the 1970s, the government was drawing up plans to re-model the substance of Singapore's comparative advantage (Clark and Kim 1995; Ho 1993). Policy thinking in the mid 1980s alternated between strategies to retain manufacturing by shifting to higher forms of value-added production, and towards developing service industries. The urgency of realising these goals became evident with the 1997 Financial Crisis (Ho 2003).

The post Financial Crisis period consolidated two significant policy platforms: cluster based development initiatives and a series of strategies aimed at developing a new identity for the citizen, one that would support Singapore's engagement with a globalizing world economy. The Economic Review Committee (ERC), a group of local and international experts brought together to advise the government, also recommended the adoption of a

strong services strategy. Regulatory changes were subsequently introduced to open up banking and financial services. The life sciences were flagged as a key industry for further development.

Singapore is not alone in embracing a policy of cluster based economic development. The widespread dissemination and uptake of the cluster approach throughout Asia reflects the globalisation of business knowledge, driven variously by the global profiles of business consultants and the business media, and further embodied by the flows of professionals, officials and bureaucrats to US business schools (Olds and Thrift 2005). In this context, it should be noted that Singapore has a long history of benchmarking against 'global' norms of best practice.

The second policy strand to emerge after the Financial Crisis sought to create greater acceptance amongst the population of the social consequences of further internationalising Singapore's economy. The Singapore 21 Committee, formed in October 1997 was charged with identifying a vision for Singapore in the 21st century. Its implicit function, however, was to socialise the public into the 'inevitability' of attracting and accepting 'foreign talent'—highly skilled foreign labour—including the extension of special concessions for this group. We suggest that Singapore 21 is illustrative of new expressions of economic nationalism which are being developed under conditions of globalisation. It crafts an ideal national identity for the citizen—as entrepreneurial, competitive, self-sufficient and committed to self-improvement. The ideal Singaporean is also expected to embody a particular mix of cosmopolitan sensibilities—English speaking but equally at home in the region, be it China, India or SE Asia.

These post 1997 policy shifts are suggestive of the consolidation of neoliberal ideas and modes of organisation in a developmental state. However, it is significant that the activist state continues to grow in strength despite policy language which echoes neoliberal reforms. Higher education policies, like the Global Schoolhouse project, which aim to globalize Singapore's universities, are not subject to market forces. Nor are there moves to privatise Singapore's government-linked corporations (GLC), a position reiterated in the negotiations leading up to its Free Trade Agreement with the US in 2006. Singapore made some concessions, an inevitability given the negotiating might of US service industry coalitions, but at the same time, it also exploited security concerns post '9/11' to maintain the status quo (Rodan 2006).

Despite its strong economic fundamentals, Singapore was one of the first in the region to experience fall out from the recent global financial crisis given its heavy reliance on American and European markets. Export-led recovery enabled the city-state to recover relatively quickly from the Asian Financial Crisis but will not drive rapid recovery from the present crisis as Singapore's main markets are anticipated to remain under recessionary pressure for some time. The early indicators are that the state will continue its activist role and mediate fallout from global market forces while intensifying its efforts to enable the development of new industries and new technologies. The recent global financial crisis has also highlighted the importance to Singapore of intra-regional trade, and its government is likely to accelerate integration within the Asean Economic Community (AEC) which was endorsed by its member states in 2007 (Thangevlu 2009).

Building a global schoolhouse

Singapore's education policies in the past and present have been aligned with the nation's economic priorities. At independence, English was institutionalised as the official language and in doing so Singapore confirmed its pro-western identity and allegiance with the

dominant calculus of geopolitical power. In a similar vein, the establishment of a quality technical education sector helped contribute an industrial labour force for Singapore's restructured economy.

It is significant that education functions as a 'technology of hope' in Singapore—a site where family and individual aspirations for socio-economic mobility are materialised. This stance is promoted by the government, embraced by the wider population and also by various education researchers who point to the role played by education in converting Singapore from a city peopled by an economically marginalised proletariat to the second highest per capita income in Asia (Kam and Gopinathan 1999; Ashton 2002). A well-resourced education system has been established to support the city-state's developmentalist ambitions based on the '4Ms plus M' ('multiracialism, multiculturalism, multilingualism and multireligiosity, plus meritocracy') formula. In recent times to counteract the influence of liberal global ideas, education has intensified emphasis on various citizenship building projects which are aimed at providing 'cultural and national ballast', evident in the *Asian Values* and *National Education* programmes (Gopinathan 2007; Kam and Gopinathan 1999). The project to transform Singapore into a global city and focal point for knowledge based activities has demonstrated the same close articulation with statist economic and culture-building projects, with a broad based discourse of reform highlighting the need for innovation, flexibility, entrepreneurship, creativity and commitment to lifelong learning (Gopinathan 2007, Cheung and Sidhu 2003).

The Global Schoolhouse is a key platform within Singapore's knowledge economy environment and rests on three pillars: extend financial support to an identified group of 'world class universities' to establish operations in Singapore; attract 150,000 international students by 2015 to study in both private and state-run education institutions, and re-model all levels of Singaporean education to inculcate the attributes of risk-taking, creativity and entrepreneurialism (see MTI 2007). This paper examines two initiatives within the Global Schoolhouse: the World Class Universities initiative along with the internationalisation approaches adopted by the National University of Singapore.

Before moving onto examine the workings of these strategies, a few comments on the Singaporean public policy context are instructive. Singapore is a monolithic state with a small population, competent bureaucracy and a political class that is technocratically inclined. These features help to remove coordination barriers which typically afflict public policies aimed at 'joined up governance'. The objectives of the Global Schoolhouse, for example, are complemented by policy reforms in the spheres of education, research, urban re-development, taxation, immigration and intellectual property. Singapore offers urban liveability, tax breaks, IP protection, generous research funding in the technosciences and liberal immigration rules to attract corporations and the highly skilled.

From the government's perspective, inviting foreign 'world class universities' to establish presence in Singapore would enable the city-state to exploit their 'brand equity'. In the early days of the Global Schoolhouse, the project was dominated by research-intensive American institutions: MIT, Georgia Tech and Duke University were funded to run graduate level programmes, while Johns Hopkins University was to conduct biomedical research and provide doctoral training. The Chicago Graduate School of Business was assisted to establish a 'campus' in a refurbished heritage building, the House of Tan Yoke Nee, and Wharton Business School was contracted to provide expertise in setting up Singapore's third university, Singapore Management University. The initial thrust towards the technoscientific domains and management education has given way to some diversification. New York University's TISC School of Arts started classes in the 2007/2008 academic year. Diversification has also involved the inclusion of non-American

universities such as INSEAD, a European business school, and the Indian Jain School of Management.

There is now awareness within the government and bureaucracy of the policy shortcomings of Singapore's earlier industrialisation era which diminished the roles of local entrepreneurs and reduced indigenous entrepreneurial capacity. Higher education is expected to help remedy this shortcoming by producing more entrepreneurial graduates and through partnerships with world class universities which have succeeded in the research-based entrepreneurialism. For Singapore's universities, which are young and have largely focused their energies on producing high quality undergraduate programmes, building domestic research capacity by 'leap-frogging' into a research-intensive culture is an ambitious goal. They are now required to establish research synergies and partnerships with globally positioned research institutions and expected to emulate their successes in entrepreneurialism, innovation, and international student recruitment. Academic staff are encouraged to develop entrepreneurial mindsets and capabilities that will further the commercialisation of knowledge. While universities are expected to benchmark themselves against a real (and imagined) standard of global excellence, they are also provided with the necessary resources. The New Public Management policies and practices that have radically altered the culture of public universities in the Anglo-Saxon countries have had different manifestations in Singapore. Selective strategies and practices of marketization and managerialism including performance management, and research assessment have been encouraged, but there is little evidence that the state is relying on market forces to finance higher education.

Policy documents and ministerial speeches imply that Singapore's knowledge economy aspirations are premised on privileging the technoscientist and, higher education entrepreneur (Tan 2008b). National research priorities are similarly oriented towards the technosciences and research commercialization is encouraged and supported, as is the case in many high income countries (see Kenway et al. 2007). From the government's perspective, technopreneurs and higher education entrepreneurs are development architects who have the capacity to generate wealth for the nation.

Reengineering a small and newly industrialised country into an innovation and knowledge-intensive hub is nevertheless a risky endeavour (see Sidhu 2009a, b). First, there is a need to manage local anxieties that the government is extending privileges and jobs to foreigners at the expense of Singaporeans. This is particularly contentious during difficult economic times, and the government has embarked on a public relations strategy to re-state its commitment to domestic capacity building while highlighting the imperative to seek 'high value' human capital to further Singapore's knowledge economy aspirations. Domestic capacity building involves, among other strategies, the provision of education, training and retraining to prepare Singaporeans for 'higher value added jobs' (Iswaran 2009). Second, there is a need to counteract perceptions that Singapore's political culture could be hostile to academic freedoms and to this end, the government has embarked on promotional initiatives to re-brand the city-state as a knowledge hub and site for creative freedoms.

Methods

The research informing this paper used three instruments to gather the reported data: interviews, surveys and document analysis of government policies, university annual reports, newsletters and marketing materials. Media discourses were also scrutinized.

The analysis of the Singapore-MIT Alliance (SMA) is based on semi-structured interviews conducted in 2007 with eight staff, three with executive and managerial

responsibilities and five who were involved in SMA related research, five doctoral students and eleven alumni of the Singapore-MIT Alliance. The sample was purposive rather than random: the intention being to interview those with executive responsibilities who interfaced with politicians, policymakers and institutional leaders, as well as those who participated in the teaching and research activities associated with the Alliance.

Both Singaporean and MIT Program Directors were contacted by letter, e-mail and telephone to ascertain their willingness to participate in a 45 min long semi-structured interview. A limitation of this study of the SMA rests on its largely Singaporean sample as senior MIT staff either declined to participate when contacted or did not respond to repeated requests for an interview. US participants in the study were those at postdoctoral and Assistant Professor levels. Senior Singaporean staff were asked to provide information on the history and objectives of the Alliance, key performance indicators, student recruitment strategies and the strengths and limitations of the Alliance. SMA alumni, many who were engaged in academic and research work, along with doctoral students and postdoctoral fellows were also interviewed. They were asked about their motivations for selecting the SMA and their subsequent experiences of this transnational education and research partnership. Data from a small-scale survey conducted through *mit bbs* a bulletin board frequented by MIT students of Chinese nationality was also used to gauge former students expectations and experiences of the Alliance. Some of these students had returned to China or re-located to the US.

To summarise, the analysis of the SMA is based on the interview accounts of some 24 research subjects. In situating the SMA within the broader developmental strategy of the Global Schoolhouse, we also used insights obtained through interviews with other key Global Schoolhouse actors: a government official based at the Economic Development Board, a director of a government research institute, with a focus on engineering and four individuals with executive level responsibilities in two other institutions within the 'world class universities' initiative of the Global Schoolhouse project.

The survey of international students at the National University of Singapore was conducted in mid 2008 and is based on the analysis of 504 completed questionnaires by students who had spent at least a semester (4 months) as a full time student in NUS. A non-random quota sample was designed to replicate the international student population in NUS along the following four dimensions: gender, science versus non-science enrolment, undergraduate and graduate enrolment. In terms of sending countries, the sample contained 20% from the highest sending country (China); 20% from 2nd highest sending country (Malaysia), 10% from the 3rd highest sending country (India), 30% from all other East, South and Southeast Asian countries; and 20% non-Asians. The international student sample was asked to complete a 15-min questionnaire which collected data on how they selected NUS, their adjustment process and their future plans. The survey team was recruited from Science and Non-Science fields of study and consisted of 12 undergraduate students and 16 graduate students. They were instructed to collect the sample based on the quotas described above. In most cases, they approached their friends and acquaintances, in their dormitories, places of work (classes, libraries and laboratories) and in campus public places (cafeterias, common walkways). Given the nature of social networks, undergraduate students recruited participants from their own undergraduate cohorts as well as from their own faculties. Since graduate students are more dispersed and harder to reach, a large team was needed. Being mainly international students themselves, some graduate student team recruited participants from their own country networks and these tended to also be more dispersed in terms of fields of study, and their country of origin.

In the next section, we analyse two Global Schoolhouse initiatives: the Singapore-MIT Alliance which is officially showcased as a success, and the internationalisation of the National University of Singapore. Both are useful sites from which to understand the changing missions of universities in Singapore.

Policy in practice

The Singapore-MIT Alliance[1]

In November 1998, a Memorandum of Understanding between the Singapore government and the Massachusetts Institute of Technology was signed, establishing the Singapore-MIT Alliance. The Alliance (also referred to as SMA) emerged following a 1997 MIT review of engineering education in Singapore's universities commissioned by the government in response to its concerns that its engineering graduates were not sufficiently entrepreneurial. The review recommended collaborations with external parties and systemic changes in Singapore's engineering programmes. MIT was subsequently invited by the government to enter into an educational 'alliance' that involved Singapore's two national universities, the National University of Singapore (NUS) and the Nanyang Technological University (NTU). It is broadly acknowledged that the decision to approach MIT was a top–down decision proposed by Dr Tony Tan, then Deputy Prime Minister and Minister of Defence, and an alumnus of MIT.

Top–down initiatives are not uncommon in Singapore and are generally accepted by a population that has been socialised by a national narrative of crisis and survivalism. The SMA and other key Global Schoolhouse projects were formulated in the shadow of the Asian Financial Crisis. Their announcements were animated by a resonant theme of Singapore's fragility and the need for re-invention to 'stay ahead' (Shanmugaratnam 2004; Tan 2000; Wong 2003).

A decade ago when the Singapore-MIT Alliance was formalised, Singapore was not regarded as a study destination by serious postgraduate students. MIT's brand name was anticipated to, and did influence individual students to choose Singapore to further their studies. Tightened US visa and entry requirements after the 2001 attacks on the World Trade Centre, and a generous scholarship programme are additional factors which worked in Singapore's favour.

The programme's recruitment efforts have largely been directed at students from Asia although statistics of students' countries of origin are deemed too sensitive to be publicized. Singaporeans do not constitute the majority among its recipients, suggesting that the SMA also functions as a policy instrument to attract 'foreign talent'. One government official described the programme as a vehicle for: *"soft power; [even] when they re-locate to another geography they will still think of Singapore when they become leaders of their*

[1] The analysis of SMA is based on interviews conducted in 2007 with eight staff, three with executive and managerial responsibilities and five who were involved in SMA related research, five doctoral students and eleven alumni of the Singapore-MIT Alliance. Data from a small-scale survey conducted through *mit bbs* a bulletin board frequented by MIT students of Chinese nationality was also used in addition to insights from interviewees from government officials and senior staff from other Global Schoolhouse initiatives. Interview accounts of some 30 research subjects were used along with analyses of policy documents and media and institutional discourses such as annual reports of universities, and staff newsletters.

companies, when they have a major decision to make." That stated, an applicant's 'Asia literacy and affiliation' is an implicit factor in determining their selection as this senior SMA professor notes:

> We also look to see if they are motivated to stay in Asia. It's not much point [just] training them for the US. We ask them questions about how they see Asia's economic performance and development in the future…" (staff, SMA).

The financial risks of cross border educational ventures have been well noted for deterring reputable American universities (Eckel et al. 2007). In MIT's case, the financial risks which accompanied the SMA—'the world's most technologically advanced point-to-point synchronous educational program'—were absorbed by Singapore. MIT thus secured revenue and the opportunity to position itself in an economically dynamic region, known for being one of the largest providers of international students for elite US universities. Partnering with the Singapore government removed administrative and bureaucratic hurdles typically confronting universities that seek to establish cross border initiatives such as seeking accreditation and negotiating quality assurance with national regulatory bodies. The Singapore government provided resources and personnel to recruit students through a series of 'roadshows' throughout the region. Finally, the provision of bond-free scholarships to students removed the hurdle of the Alliance partners having to levy fees so as to meet revenue targets in the competitive field of transnational education.

Although promoted as a curriculum joint venture, it is significant that MIT undertook a leadership role in devising the curriculum for the Masters coursework programme and in shaping the PhD programme. A series of research projects are also funded through the Alliance to facilitate engagement between Singaporean researchers and their MIT counterparts. Principal Researchers on these projects spend 2 weeks at the partner institution giving research seminars, networking and teaching.

A revised agreement between the government of Singapore and MIT in 2005 saw closer alignments between the SMA's programmes and Singapore's changing developmental priorities. Where the first phase of SMA (SMA-1) was dominated by Engineering related programmes, the second phase of SMA, SMA-2, has seen an increased emphasis on the Sciences, in particular, the Biomedical Sciences. Although not the premier North American institution with expertise in the biomedical field, there was no question of replacing MIT as an alliance partner. A new development in phase 2 of the Alliance saw SMA-2 students having the opportunity to obtain a dual Masters degree from MIT and from the Singaporean universities—NUS or NTU. This agreement was seen largely as a vote of confidence by the Singaporean universities although their proposal for a dual PhD degree was rejected.

In the years following the SMA's inception, the government's trust in MIT's credentials in contributing to knowledge-led, economically productive innovation has not diminished as this excerpt from a speech by Dr Tony Tan, who now heads Singapore's National Research Foundation:

> If the companies founded by MIT graduates and faculty formed an independent nation, the revenues produced by the companies would make that nation the 24th largest economy in the world. The 4000 MIT-related companies employ 1.1 million people and have annual world sales of USD 232 billion (Tan 2008b).

The Alliance has largely succeeded in meeting most of its objectives, based on indicators as student enrolments and PhD completions, publications and patents (see SMA 2006). Its success in generating technopreneurs is less clear given the long time delays

involved in achieving entrepreneurial success. The early indicators from our study suggest that fewer graduates choose the entrepreneurial pathway, preferring safer career choices in academia and industry. The reasons provided by alumni, students and staff interviewees include a broader social context which does not encourage failure ("*Singapore is not a place [to] tolerate failure*") and an equally risk-averse and conservative approach by employers:

> [In the US] if you have a PhD from MIT, even if you take a couple of years to pursue your company, you are still likely to get a job. If you take that [entrepreneurial] route here, it will set you back in debt.

The challenges of building and governing viable transnational education alliances like the SMA should not be underestimated. First, it is significant that the success of the SMA rests on the generous financial resources provided by the Singaporean government and the considerable autonomy afforded to MIT. Financial support of this magnitude would elude most developing countries and the Alliance is unlikely to become a template for transforming developing countries into knowledge economies, and their universities into innovation engines. Politically, the governing party's historic openness to foreign ideas and people, its tendency to foreground economic rationalities in policymaking and the hegemony that it exercises are factors that may also be specific to the city-state (see Sim 2005; Rodan 2006).

The global aspirations of MIT, like many elite American universities, rests on 'the hunt for revenue, prestige and academic quality' (see Eckel et al. 2007; Stromquist 2007). The issue of financial remuneration is particularly significant in understanding the cross border motivations of these institutions. MIT was able to source monies for desired projects, to hire research staff and to purchase expensive equipment—endeavours which might not otherwise be financially feasible without the support of the government of Singapore (Magenti 2006). As one MIT-based postdoctoral interviewee observed;

> The fact that MIT is very rich doesn't mean that the professors are rich. The professors sometimes don't have a lot of money to do projects.

Generous funding by Singapore meant that SMA's programmes were shielded from the short-term market imperative of profitability. This factor along with the autonomy that MIT had over the curriculum, meant that academic quality remained reasonably high.

MIT's presence in Singapore, a 'gateway' to an economically dynamic Asia, a region which is currently the largest source of international students for US universities, is likely to open future opportunities that will ultimately contribute to its global prestige and its finances.

Although described as a success, our study suggests that some of the policy assumptions underpinning the Alliance have been problematic. The assumption of policy makers is that researchers and other groups of knowledge workers are rational actors, capable of seamless mobilities across borders. The logical extension of this thinking is that 'world class' research and development activities can be easily disembedded from their local/national context. Singapore continues to face challenges in its endeavour to retain top-drawer foreign talent—established innovators and knowledge entrepreneurs. Although generous funds are available for bright MIT doctoral and postdoctoral students to visit Singapore and to establish collaborations and networks with their Singaporean peers, retaining them in the medium and longer term continues to be problematic, particularly for those without emotional connections and family ties within 'Asia'. Similarly, MIT researchers and academic staff are known to prefer 'fly in fly out' arrangements rather than committing to a

period of residence in Singapore. It is significant that the issue of residency requirements by MIT staff in Singapore was still under negotiation when the new research partnership, the Singapore MIT Alliance for Research and Technology (SMART) was announced in 2006.

To summarise, the Alliance exemplifies some of the broader structural and micro-level changes driven by Singapore's government and the ambitions of foreign educational institutions. At the inception of the Alliance and the Global Schoolhouse platform, the government was explicit in defining its aspirations for Singapore: to become the 'Boston of the East'. Singapore's universities were cast in the role of learners, required to 'stretch themselves' through engagements with world class universities. While the goal of emulating the 'American mindset' in knowledge driven entrepreneurialism is likely to continue to influence sections of Singapore's political and bureaucratic class, there are indicators that Singapore will intensify its regional engagements and seek to steer its universities towards engagements with industry and higher education institutions in Asia (Tan 2008a, 2009).

The policy of privileging foreign talent and world class universities over local universities and human capital has raised the question of whether Singapore's knowledge economy aspirations are having the effect of re-modelling the institution of citizenship, with those who can provide intellectual capital for the development of the city-state enjoying entitlements and accommodations above and beyond that of its citizens (see Ong 2007). The government has been at pains to reassure the electorate that the policy of courting of foreign talent and elite foreign universities is not at odds with capacity building of domestic institutions and local human capital (see Iswaran 2009). In response to growing public disquiet about 'foreign talent', the state is also working to counteract the likelihood of providing a free ride to nomadic, economically rational (techno)entrepreneurs, promiscuous in their affiliations and relations. To this end, the 2007 World. Singapore policy suggests a commitment by Singapore's policymakers to make Singapore an attractive global city to another category of foreign talent—those with affiliations and interests in Asia who are anticipated to stay (see Teo 2007).

In 2006, the Singapore government announced the establishment of SMART—the Singapore MIT Alliance for Research and Technology to be sited at CREATE, Singapore's new high tech, $ 600 million campus. In his opening address, the chairman of Singapore's National Research Foundation and former Deputy Prime Minister, Dr Tony Tan noted the importance of Singapore's universities 'embracing a culture of academic entrepreneurship like MIT in order to play an active role in contributing to the economic development of Singapore' (Tan 2008b). Academic entrepreneurship is thus regarded as a vital contributor to the nation's well being.

Funded entirely by the government of Singapore, SMART's labs will undertake research in areas flagged by the government to be important for Singapore such as the biomedical science, interactive digital media and water technologies. For MIT, SMART represents opportunities 'for new and unique research facilities', 'multinational collaborations' and 'a research gateway, a stepping stone to broader connections in Asia, including China and India' (MIT 2006). While executive staff were enthusiastic in greeting news of the SMART initiative, rank and file staff at MIT raised other concerns—whether relocating research staff from Cambridge to Singapore would divide the MIT community and how graduate students would adjust to a non-US context (MIT News 2006; MIT FNL 2006). The challenge of re-embedding a culture of research and innovation in a vastly different setting, a policy issue that confronted the SMA, has not gone away.

Remodelling NUS: 'A leading global university centred in Asia'

The National University of Singapore (NUS) was established in 1905. Presently it has a student enrolment of 23,000 undergraduates and about 9,000 graduate students.[2] For much of its history, the university's contribution to national development was largely in terms of providing education and training to develop a professional and bureaucratic labour force. The shift towards an entrepreneurial model began in earnest at the end of the 1990s, gaining momentum with the recruitment of President Shih Choon Fong, a [former] Singaporean described as 'Harvard trained', with a background in US Industry and research administration experience at an Ivy League university in the US.

In response to national narratives of building a 'new economy', a number of key initiatives were announced to enable 'NUS to be to Singapore, what Stanford is to Silicon Valley' (Shih 2000). At the beginning of the new millennium, the new President outlined his goal of transforming NUS into a '*Global Knowledge Enterprise*', elaborated as first, 'changing the mindsets of staff, 'making room for the entrepreneurial spirit', 'shutting out the bureaucratic mindset', and 'becoming resourceful, innovative and pioneering'. Second, building borderless departments and faculties, in effect, establishing a borderless knowledge community. The Life Sciences were noted as presenting significant intellectual challenges which required the strategic expertise of Medicine, Dentistry, Science, Engineering and Computing, disciplines singled out for their potential to contribute to Singapore's nascent pharmaceutical and biotechnology industries. NUS' Social Sciences, Law, Humanities Faculties were also noted to be well placed to contribute to Singapore's development by providing critical analysis and indigenous insight into Asian economy, polity and society. Third, the remodelled NUS was charged with producing 'citizens of the world, versatile and alert to global as well as local opportunities, willing participants in lifelong learning, with a sense of personal responsibility and moral obligation to contribute to society' (Shih 2000).

The success of this broader initiative to re-model NUS a rests on a long-term vision and substantial support by the state. NUS' endeavour to become a 'global knowledge enterprise' also resonates with the broader national imperative to re-engineer the institution of citizenship. It requires individual university staff to re-imagine themselves as development architects, contributing to Singapore's transformation into a knowledge and innovation hub. It requires disciplinary boundaries and parochialisms to be subverted and it asks Singaporeans to appreciate and model themselves on foreign talent.

Organisationally, an entire division, NUS Enterprise, has been created to coordinate the global knowledge enterprise. Under its auspices, an Entreprenuership Centre has been established to promote and undertake research on entrepreneurship, and a Venture Support Unit provides assistance to students, staff and alumni engaging in innovation. An Overseas College Programme has also been set up, enabling the university's brightest undergraduate students to work as interns at high tech start up companies located in 5 key sites—Silicon Valley, Philadelphia, Shanghai, Stockholm and Bangalore (Wong et al. 2007).

A subtle but nevertheless important shift in NUS' global aspirations, recently announced by its current President, Tan Chorh Chuan is to become 'a leading global university centred in Asia' The university's mission is to innovate new models of global education in partnership with overseas partners, with a strong emphasis on Asian perspectives and issues. Attracting 'world class faculty' with expertise in Asia is a key

[2] Assessed 2 August 2008: http://www.nus.edu.sg/iro/aboutus/index.html.

underlying strategy (Tan 2008a). NUS' vision is portrayed as simultaneously global, regional and national.

If the Singapore case is distinctive from other enterprise universities in terms of the primacy given to attracting overseas talent, then one indicator of the success of this policy in practice is the number of international students it is able to attract in a relatively short time span since Singapore announced its plans to become an education hub. In this respect the key performance indicator is the attributes used by students to exercise their choice of university.

Figure 1 confirms the significance extended to the reputation of the university by international students enrolled at NUS, confirming previous studies undertaken in established education exporters about the importance of academic reputation in student decision making (see Mazzarol and Soutar 2002; Soutar and Turner 2002; Veloutsou et al. 2004). Of the 9 attributes listed in the survey, an overwhelming 72.4% of the students surveyed mentioned the university's reputation. Reputation is premised on the provision of quality teaching and training and adequate resourcing of research activities as well as international recognition of NUS' degrees including in students' home countries. NUS' offers an internationalised curriculum which draws on the global and regionalised networks of its academics and researchers, and provides instruction in English, now regarded as a global language. These factors prompted 25.8% of our sample to choose Singapore as a study destination because of the international curriculum offered at NUS (see Fig. 1). The fact that NUS does not relegate undergraduate teaching to casual sessional staff as is the case in many US public universities and Australian universities also favours its academic reputation. The institutional commitment to, and funding of, interdisciplinary research and education is also likely to improve NUS' reputation in the longer term.

61.3% of the international students surveyed mentioned having financial support (either in terms of a scholarship, tuition grants or student loans) as a reason for studying in Singapore. Given that the majority of foreign students in NUS are from either Southeast

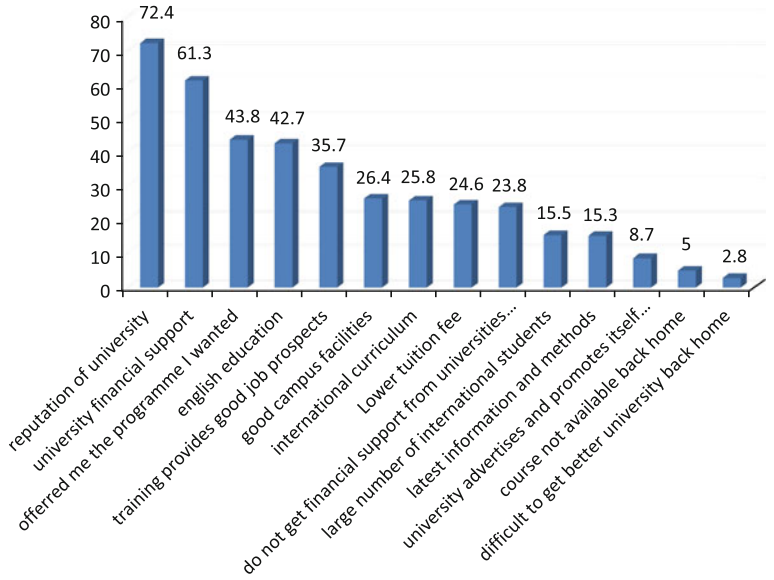

Fig. 1 Reasons given by NUS international students for studying in Singapore (%)

Asia, East Asia (China being the major sender) or South Asia (India being the major sender), the presence of financial support is attractive for academically strong students from middle and possibly working class backgrounds. In short, access to regional higher education centres like NUS for bright students, some from less advantaged backgrounds could create the conditions to reverse existing patterns of elite formation in the region which has seen the offspring of business and political elites travel to established education destinations such as the North America, Europe and Australia.

It is also important to note that students in the sample surveyed were not selecting NUS as a default choice because of their failure to obtain a place in their local universities, or because their preferred courses are not available. Only 2.8% of the sample we surveyed cited these factors—course inavailability or failure to secure a place as reasons for enrolling at NUS. The majority of students interviewed wanted an overseas study experience and NUS figured highly because of its reputation and provision of financial support.

It is now well known that international students do not just select a good university but also consider attributes of the host country, giving consideration safety from urban violence, racism, and crime, along with the cost of living issues (see Mazzarol and Soutar 2002; Pimpa 2003; Veloutsou, Lewis and Paton 2004). Our survey confirmed these findings. Figure 2 shows that safety is uppermost in the minds of international students, with 58.9% of those surveyed mentioned Singapore's safe environment as a reason for them studying in Singapore.

Given the focus on talent attraction, one indicator of the ability of the country to keep talented individuals is employment opportunities after graduation. That more than a third of those surveyed mentioned good job prospects as a reason for coming to Singapore suggests that the government's promotional messages of an economically dynamic global

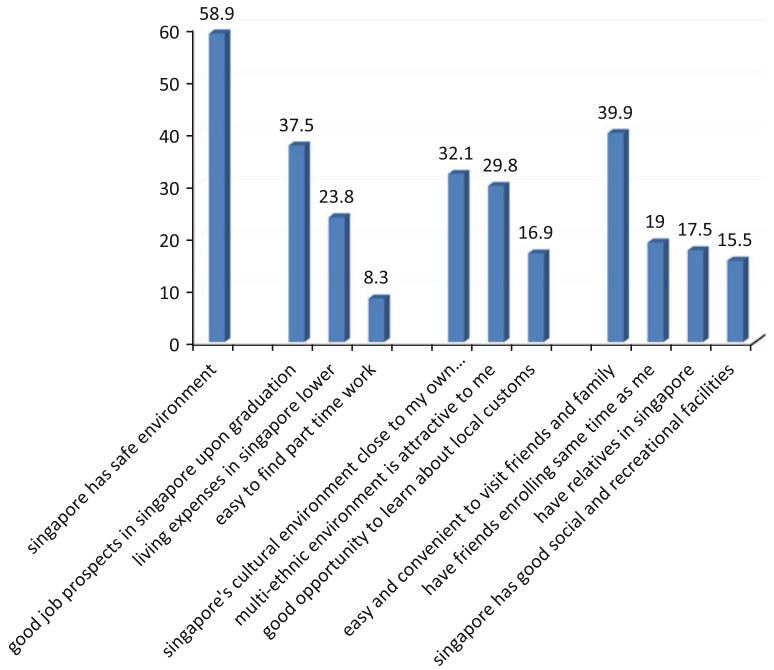

Fig. 2 Country attributes and its influence on NUS international students' education choice (%)

city in a bustling region is being heard. Besides job prospects, the other significant economic factor is the relatively lower cost of living (compared to major higher education markets in the North America, Europe and Australia), cited by 23.8% of the students.

Figure 2 captures the collective cultural and social reasons that shape the decision to study in Singapore. Its strategic location in a region noted for its youthful demography, spatial proximity to home countries, familial and diasporic networks and a multi-cultural environment which offers a (perceived) cultural proximity to students' home cultures combined to convince close to one-third of the students to select Singapore as a study destination.

Conclusion

Although an agile economic performer Singapore's small size and population nonetheless renders it vulnerable to the vicissitudes of economic globalization. The city-state has instituted major policy changes in order to remain a relevant actor in the regional and global economy. Two points are of significance in our analysis of Singapore's knowledge economy initiatives: first that this broader platform is bolstered by the resources of a wealthy developmental state with reserves that would be the envy of most countries. Second, its knowledge economy aspirations rest on re-engineering the institution of citizenship to create an ideal type citizen with the intellectual, social and cultural capital to contribute to Singapore's knowledge economy aspirations. We examined the knowledge hub from the perspective of two programmes nesting under the Global Schoolhouse project: the Singapore MIT Alliance, a networked global engineering education and research programme, and the strategies used by the National University of Singapore (NUS) to remodel itself into an entrepreneurial 'leading global university in Asia'.

The Singapore-MIT Alliance was one of the earliest of the Global Schoolhouse initiatives. It was formulated to promote a more entrepreneurial engineering education programme in Singapore. The SMA was also used as a programmatic instrument by the government to steer Singaporean staff to benchmark themselves against a real and imagined standard of global excellence embodied in MIT. The SMA has been a key plank in the platform to seek leverage from the brand equity of world-class universities. Although hailed by the government and by MIT as a success, it is also significant that there have not been any links between SMA staff and projects at the up coming new SMART (Singapore MIT Alliance for Research and Technology) project. We argue that achieving research synergies between institutions with vastly different histories, missions and trajectories as MIT and NUS presents many challenges, not all of which can be surmounted by generous funding and access to state-of-the art technological equipment. Assembling a successful transnational education and research alliance raises issues about the embedded and embodied aspects of innovation and entrepreneurship and there is a need for policymakers to re-imagine the technopreneur and higher education entrepreneur as complex human actors who are embedded in specific cultural and social contexts.

As NUS embarks on its entreprenuerial mission in response to the new development exigencies confronting Singapore, one crucial undertaking will be the task of attracting talented students and retaining graduates to work either in Singapore or in Singapore's various enterprises regionally. Singapore is also investing hope that those alumni who move away either to their home countries or third countries will nonetheless look fondly on the city-state in the event of making future investments and political decisions. NUS has made a good start in internationalising its student body, and its leadership has exhibited

awareness of the need to distinguish between a strategy of crafting an attractive market image versus building a reputation (see Hemsley-Brown and Oplatka 2006). Although initiatives like the Singapore-MIT Alliance and various joint teaching and research programmes with elite universities are useful in getting the university noticed, NUS' reputation ultimately will be determined by its capacity to develop a distinctive research and education platform which, we argue, will need to engage with national and regional interests and changing geopolitical configurations.

In the face of the Global Schoolhouse's imperative to re-model the institution of citizenship, NUS faces the challenge of balancing the needs of domestic students and citizens with the interests of a growing body of international students. Singapore lags behind OECD countries in higher education participation, with only 23% of high school leavers obtaining a university place. There is increasing concern amongst sections of the middle class about the inability of Singaporeans to obtain places in their national universities. Local universities have been cautious about receiving graduates from the city-state's numerous polytechnics, forcing significant numbers to study overseas at considerable personal expense to upgrade their diplomas into degrees. Although there are plans to increase participation to 30% by establishing a fourth university by 2015, it is unclear whether the proposed university will provide opportunities for mass enrolments (Davie 2008).

In a vastly unequal region, Singapore stands out as a country which has has been transformed from a city of coolies,[3] taukehs[4] and privileged Europeans to a global metropolis with a sizeable middle class and a reasonably well paid working class (Trocki 2006, Yeoh 1996). That stated, the possibility of a fallout from Singapore's citizenship reengineering project should not be ruled out. Can NUS contribute to debate and strategy to reconcile the current brand of meritocracy with equity and social cohesion? We suggest that these are critical questions confronting Singapore's premier seat of higher learning. The contributions it makes may lie in the university borrowing selective aspects from a liberal arts model of higher education, thus raising awareness about social issues, instead of a whole-sale emulation of an elite research intensive institutional model. (see Price et al. 2003).

Although economic nationalism is often regarded as an anachronism in this age of globalisation, the Global Schoolhouse reveals the co-constitutive relations between economic nationalism and economic globalisation. To sustain its economic progress, Singapore is crafting a new type of national identity for its citizens: transnational, self-sufficient, innovative, entrepreneurial and committed to self-betterment. The city-state's economic future and survival is portrayed by government to be reliant on such a citizen, suggesting that the accumulation of innovativeness and entrepreneurial potential is increasingly becoming an obligation of citizenship. For Lim (2006), these expectations construct an identity for Singapore as a place, to be used instrumentally by all who pass through rather than as a nation who commands emotional attachments, loyalty and belonging.

To conclude, Singapore's current policy to remodel itself into a knowledge based economy reflects its development trajectory: it has a history of embracing foreign ideas and foreign expertise, and its education policies have followed its broader economic development policies. The city-state is now seeking to gain innovation leverage in much the same way that it acquired capacity in manufacturing expertise—by using foreign institutions and foreign talent 'to learn to do the job'. It has been able to provide the requisite

[3] Coolie—a term used to describe unskilled labour in East and South Asia.

[4] Taukeh—a term describing the merchant class in Singapore and Malaysia.

resources to play in the high stakes of knowledge-driven production. Aware that its earlier industrialization strategy has displaced local entrepreneurial talent, the governing PAP is now seeking to develop indigenous capacity. The recent global financial crisis has highlighted the need for greater regional affiliations. It is notable that the city-state is now foregrounding the need to recruit regional talent—the Asia literate and Asian affiliated who have the potential to commit to Singapore's longer-term development.

At its inception, the Global Schoolhouse project was promoted as an East–West bridge and 'springboard'. It was portrayed as providing rich opportunities to bring a US-centric model of world's best practice to Singapore's universities. The East–West analogy played on the island state's colonial heritage, English speaking population, modern and western-friendly government—factors anticipated to attract elite foreign institutions keen to position themselves in an economically dynamic but culturally alien Asia. More recently, a discourse of Asian renaissance has emerged, premised on a shift in political and economic power towards the Asian hemisphere (see Mahbubani 2008). In anticipation of a reconfiguration in geopolitics, Singapore's knowledge economy initiatives like the Global Schoolhouse project may well seek greater engagement and alliances with the region's best universities. Such regionalization initiatives may enable a shift away from a predominantly British and American template of academic excellence, to include new expressions of global excellence.

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