

DEVELOPING SINGAPORE'S EDUCATION INDUSTRY

Aim

1. This paper outlines the developments in the global education industry, the potential of developing education as a business in Singapore, the existing developmental hurdles and recommendations going forward.

Background

2. In the 1985/6 Economic Committee led by then Minister of State (Trade and Industry) BG Lee Hsien Loong, identified education as one of the 18 services sectors to be nurtured and promoted (*The Singapore Economy: New Direction*, Feb 1986). Education was recognised for its revenue growth potential, net worth to the economy, as well as its export earning potential.
3. To develop the post graduate segment of the industry, the EDB in 1998 embarked on a plan to attract at least 10 World Class Universities to establish a significant presence in Singapore within 10 years. To date, 8 renowned educational institutions have been attracted to Singapore, with more in the pipeline. Each institution is a centre of excellence in education and research, with strong industry linkages. Please refer to **Annex 1** for details of the 8 projects.
4. Currently, the education industry contributes S\$3.0 billion¹ to the Singapore economy, which is 1.9% of the GDP. There are approximately 1,800 education establishments here employing 47,000 people, with 50,000² foreign students in Singapore in both public and private institutions. Most of the foreign students here are in the tertiary and commercial school segments of the industry. A majority of those in the tertiary segments are on Singapore government scholarships of one kind or other. Those in the commercial school segments tend to concentrate on the lower fee paying courses.

International Perspective of the Education Industry

5. According to Merrill Lynch, education is a US\$2.2 trillion industry worldwide and employs some 5% of the global workforce. BusinessWeek (2002) estimated the U.S. education industry as the world's largest, amounting to US\$800 billion in annual revenue (for both public and private institutions). Besides being a public good, education is a significant service export for Australia and the UK. Education contributed 5.5% to Australia's GDP, and 5.6% to UK's GDP in 1999.
6. Education tends to be a counter-cyclical industry as the unemployed seek to retrain and upgrade themselves. In the case of Australia, this particular sector, together with agriculture, has contributed to its resilience in both the 1997-8 and current recession. During the Asian crisis, Australia's international student numbers continued to grow, as the fall in onshore learning was offset by the rise in offshore learning. Please refer to **Annex 2** (Overseas Student Numbers in Australia).
7. According to the Y2000 APEC Services Group, the global export market for higher education is about US\$30 billion. There are already more than 1.8 million (stock)

¹ Department of Statistics, 2000

² Based on the number of foreign student passes issued by educational institutions, Singapore Immigration & Registration data as at September 2001

international students who pursue their higher education abroad globally (UNESCO, 2000). About 45% of these students come from Asia with China, Korea, Japan, Malaysia and India identified as the top 5 source countries. The demand for quality higher education is expected to increase significantly, especially with a growing middle class in the region. China's education market has witnessed significant growth in the past 15 years. The number of students in higher education will increase from 11 million to 16 million by 2005 (China News Net, Beijing, August 2001). In China, there is an estimated shortage of 3.2 million places at the university level (Straits Times, 12 December, 2001).

Singapore's Competitive Advantages and Constraints

8. Singapore has several competitive advantages that position it well to be a global education hub:
 - **Geographic location.** Singapore is located within 8 hours flying time of 2.8 billion of the world's population. In particular, it is strategically positioned close to top source countries for international students (e.g. China, Korea, Japan, Malaysia and India).
 - **Reputation for educational excellence.** We have a strong academic reputation due to a well-developed public education system, from which a high number of students gain entry to top universities worldwide.
 - **Singapore's reputation as a business hub.** Our ability to facilitate the efficient movement of people, goods, money and information to-and-from different regions has made us a centre for business and technology. This is particularly attractive for institutions that work closely with industry.
 - **Social factors.** Singapore is also known to be a safe, cosmopolitan, progressive East-meets-West society where English is the main medium of communication and instruction. It is therefore perceived as a desirable place to live, work and learn.
9. However, there are various constraints. Education has always been seen primarily as a public good in Singapore. The public education institutions have therefore focused on providing education for Singaporeans and meeting manpower capability requirements for our industries. As a result, this sector is regulated at the primary, secondary, pre-university, polytechnic and undergraduate levels.
10. In addition, the private sector lacks a suitable quality assurance system that will provide a minimum service level, market transparency and quality control. This results in uneven quality among the professors, teachers and instructors employed in privately funded educational institutions, which ultimately affects Singapore's branding in education.
11. Other constraints such as high land and building costs, shortage of affordable accommodation and onerous student visa requirements could potentially hamper the competitive development of the education industry here. The segment-specific constraints will be discussed later in this paper.

Proposed Vision and Strategy

12. Singapore's existing public and private educational institutions have evolved over the years to offer a rich gamut of educational services. Going forward, this is a good foundation for Singapore's efforts to develop this industry as a business. The proposed vision is as follows:

To develop a self-sustaining education ecosystem offering a diverse and distinctive mix of quality education services to the world, thus becoming an engine of economic growth, capability development and talent attraction for Singapore.

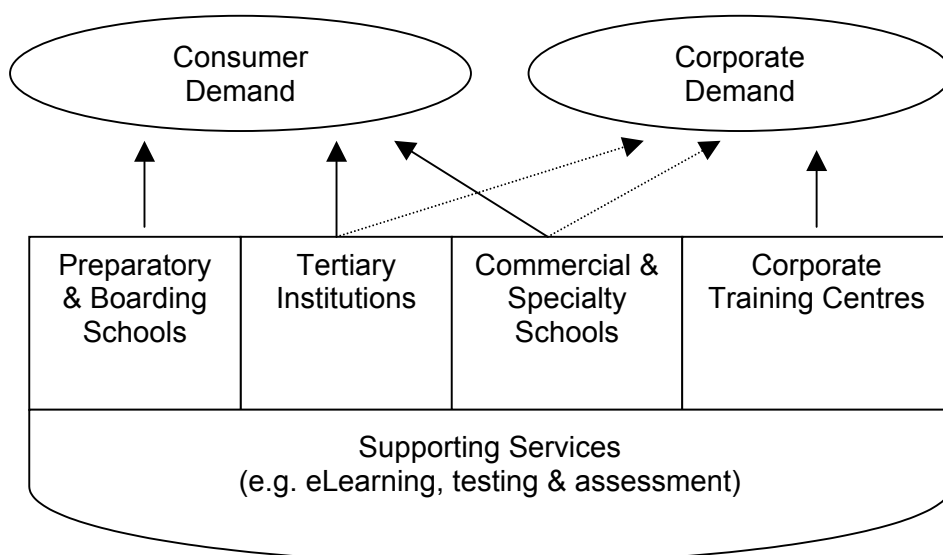
13. Education ecosystem refers to a cluster of mutually reinforcing, complementary education institutions, which vary in student enrolment numbers, country of origin, cultural environment, nature of activity, academic level, academic disciplines and subjects, research interests and fees. We envision this network of institutions will raise education standards, create more choice for Singapore students and enrich the overall student experience.
14. Economic growth. Currently, education services contribute 1.9% to the Singapore economy. A critical mass of diverse education institutions and service providers with good global branding and diverse course offerings at all levels of education will attract a larger volume of international students. This can potentially increase education services' contribution to the GDP, through the institutional and student spending (particularly from full fee-paying international students, whose expenditure is a form of export earnings for Singapore).
15. Capability development entails meeting existing and future industry needs (e.g. address demand for software engineers), as well as contributing to broader human capital enhancement (e.g. provide avenues for talent development in the performing and fine arts), and community development (e.g. create life-long learning opportunities for Singaporeans).
16. Talent attraction. An education hub with more reputed education institutions will contribute to a larger inflow of international students, which can potentially create a large pool of foreign talent for Singapore's economy if they eventually work in Singapore. Another possible end result would be a strong network of international alumni around the world.
17. To fulfil the proposed vision, a two-pronged approach could be adopted:
 - Attract and develop an optimal mix of brand and volume receptacles, in order to;
 - Attract an incrementally sizeable number of international students into Singapore.

Brand and volume receptacles refer to institutions that have built up a good branding by offering quality courses, and are thus able to attract good volumes of full-fee paying international students. In short, the focus is to build up a wide range of educational service providers targeting a global audience. Most of these are likely to be private, since public institutions will continue to have a primary goal of fulfilling domestic education needs.

Therefore, the core principle in the proposed strategy is the need to promote the regulated education segments, such as the undergraduate, polytechnic and public school sectors, so as to enable the private sector institutions to flourish.

Market Segments

18. We have segmented the market for educational services as follows:



19. Demand for educational services comes from 2 sources: the end consumer and the corporations. The demand from consumers could be for basic education, enrichment, personal upgrading or skills building, while the demand from corporations would primarily be to meet organizational training needs.
20. On the supply side, we have identified 4 key segments with good growth potential. These would be tertiary institutions, private commercial and specialty schools, and preparatory schools catering to consumer demand, and corporate training providers catering to corporate demand. There is some overlap between these segments, e.g. tertiary institutions and the commercial and specialty schools do provide executive education courses. In addition to the 4 segments, the supporting services – particularly eLearning as well as testing and assessment services – are emerging industries.
21. The following paragraphs discuss the segments in greater detail, i.e. the market opportunities, the proposed strategy going forward, developmental hurdles and proposed changes to overcome these hurdles.

Tertiary Education

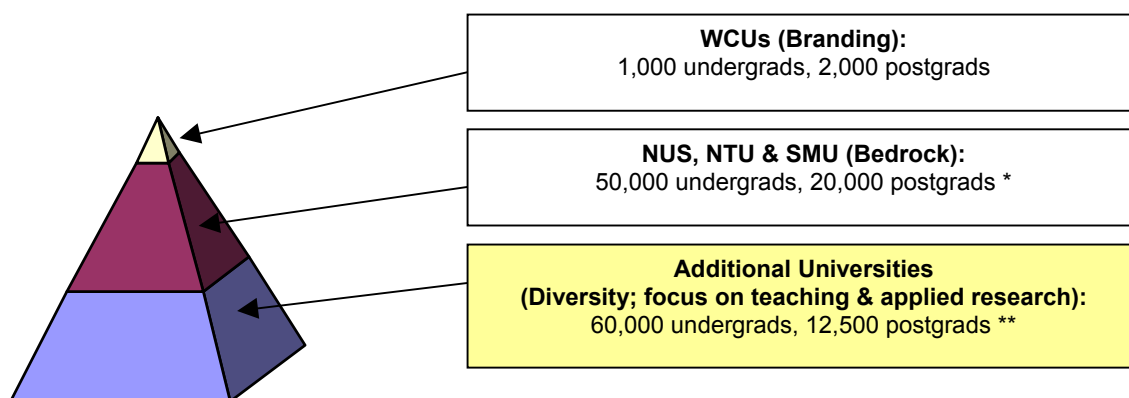
22. **Importance of the segment.** A vibrant tertiary education sector will not only attract top talent to Singapore but also help to create jobs and wealth, and fuel the economy. Firstly, it will create an environment that enhances R&D efforts and generates intellectual property. It will thereby create enterprises in Singapore and opportunities for existing companies to develop new technology. Secondly, it will develop the manpower needed for a wide range of new economic activities covering the life sciences, medical, IT and services sectors. Thirdly, it can be an income generating business if the tertiary sector can establish itself as a quality global player by attracting significant numbers of full fee-paying international students to Singapore.
23. **Market opportunities.** As mentioned earlier, there is currently an estimated 1.8 million international tertiary students globally. U.S. has 33% of the global total, while Singapore

has an estimated 1% of the market share³. NUS and NTU have established a good regional reputation, e.g. NUS was rated as one of top 5 multi-disciplinary universities in Asia (Asiaweek Magazine, 2001). Both universities have been able to attract good undergraduate and postgraduate students from overseas. This suggests that with a bigger pool of universities, we could increase Singapore's share of the international student market. However, we need to be mindful that we may be able to attract full-fee paying international students only in the undergraduate and professional postgraduate disciplines (e.g. MBA programmes), but not in the research-oriented postgraduate programmes. This is because the global practice is for the universities to provide partial or full scholarships to these postgraduate students, particularly in PhD programmes.

24. In addition, 40-50% of polytechnic students (anecdotal estimates from the 4 polytechnics) go on to a degree at some point in their career. Today, large numbers are going overseas (e.g. to Australia) or to the local commercial schools.
25. **Proposed strategy.** A possible scenario would be to have a tiered system of universities. At the apex would be the World Class Universities, which will continue to be niche centres of excellence carrying out world-class R&D, and transfer knowledge to industry. These will help in branding Singapore as a premier educational hub. The WCUs would focus primarily on postgraduate education, but this should not preclude the possibility of them offering undergraduate degrees, albeit on a small scale.
26. The next tier would be the existing universities NUS, NTU and SMU – these would continue to be the bedrock of the university segment, i.e. carrying out a broad range of R&D activities, providing the core of Singapore's manpower needs, creating a regular talent pipeline of regional scholars, and providing education as a public good.
27. The third tier would comprise additional private universities. These universities would focus on teaching and applied research, and add diversity to the university landscape. They would receive the bulk of the additional foreign student population. The universities could be foreign or local in origin, with their own campuses (foreign universities would operate independently or in conjunction with local partners), and the liberty to establish their own international to local student ratios. Most of the international students would be paying full fees. In light of the effects the tertiary sector has on national manpower planning, one possible approach is a **gradual** process whereby a number of private universities could be allowed to. Furthermore, we should ensure that the type of private universities established here are at least of the same approximate global ranking as NUS/NTU to minimise Singapore's brand-name dilution.

The diagram below illustrates the scenario for the university sector, with possible student enrolment figures in 10-15 years' time.

³ Projections based on Merrill Lynch study, 2000



* The figures represent organic growth. Currently, NUS, NTU and SMU enrol approximately 37,000 undergraduates and 15,000 postgraduates.

** These would be new students. Of the total, an estimated 50,000 would be international students (40,000 undergrads, 10,000 postgrads).

28. **Local students 'base-loading'**. Currently, the university CPR (cohort participation rate) stands at around 21% of each Primary 1 cohort (MOE, 2002). MOE is looking into the possibility of increasing the university CPR to 25% by year 2010 (i.e. an additional 2,000 students each year). In addition, Singaporean students who go overseas to study degrees (approx. 8,000/year) and working adults (i.e. from the continuing education segment) can become the potential base-load for the new universities. The incremental economic contribution would come from the 60,000 undergraduates and 12,500 postgraduates in these new universities, i.e. in terms of institutional and student spending. Of these students, we envisage that 40,000 undergraduates and 10,000 postgraduates would be from overseas. This means that the international students would outnumber their local peers in these institutions.

29. This figure of 25% may be too low given the number of polytechnic graduates going on to do degrees (see para 24). There may be a need to review whether there needs to be a CPR cap, or whether it should be increased significantly.

30. **Developmental hurdles**. Currently, no educational institution can offer a degree in Singapore without registering and obtaining the approval of MOE. In addition, the approval of MOE is needed to set up private universities. Pro-business legislative measures to facilitate the set up of private universities in Singapore will be critical. In addition, there would need to be measures in place to ensure that academic programmes are of good quality and that the various universities can compete on a level footing for local research funding and local students. This would ensure the vibrancy and growth of the segment as a whole. Annex 3 discusses the developmental challenges and proposed changes in detail.

Commercial and Specialty Schools

31. **Importance of the segment**. This is already a vibrant industry, with a total of 110,000 students (local and international students) enrolled in more than 300 private commercial, IT, fine arts and language schools in Singapore (MOE statistics, 2002). The schools offer courses with good local and overseas demand. Such courses normally do not require heavy infrastructure investments, which means the barriers to entry are low and

suppliers are able to respond to the market's needs readily. Many of the schools are for-profit entities. Their offerings range from short enrichment type courses to diploma and degree programmes (hence there could be some overlap between the 3rd tier universities' target demand and that for the commercial schools). This is a segment that is entirely private-sector driven, and much can be done to create an environment to help the players flourish. However, quality is very uneven in this segment today.

32. **Market opportunities.** The market opportunities for this segment are excellent. To meet the regional demand, the schools could be in 2 forms: industry-specific schools (e.g. in hotel management or insurance), and function-specific schools (e.g. in language, IT and management). The schools could leverage on Singapore's branding and reputation in selected disciplines such as logistics and hospitality management. Currently, many of the more established names (e.g. Informatics) are aggressive in exploring overseas markets, in terms of attracting more international students to Singapore, developing overseas partnerships (e.g. establishing overseas campuses), and adopting a 'clicks and bricks' approach (i.e. leveraging on eLearning for scalability in addressing demand beyond Singapore's shores).
33. **Proposed strategy.** One possible strategy is to build a nexus of 40 good-quality and dynamic commercial and specialty schools, each enrolling at least 1,000 international students. Surrounding this core of reputable schools would be other smaller niche schools that offer diverse courses, from hotel management to ballet. The key to building this strategy lies in removing the developmental hurdles and market inefficiencies, putting in place a quality assurance framework, and promoting collaboration between the different players. This would then allow the players to flourish and respond to the market's needs, and thus grow the segment organically. A benefit of this diverse segment would be to create a wealth of Continuing Education and Training (CET) opportunities for Singaporeans.
34. **Developmental hurdles.** Based on feedback from various players in this segment (including 3 sessions organised by the Feedback Unit), the schools face regulatory, cost and quality hurdles. Regulatory hurdles include caps on enrolment of international students, difficulties in securing student visas, stringent regulations on part-time work for international students, and private providers not being able to offer their own degree programmes. Cost-wise, the schools require significant office space and rental becomes a significant cost item. As for quality, there is no quality assurance mechanism to instill academic rigour and maintain service level quality in the providers' offerings and help the better schools differentiate their offerings from the others. Our assessment is that the hurdles are not insurmountable. What is required is twofold: first, the relevant government agencies (including MOE as the regulatory authority, SIR on the visa issues, and EDB and TDB as promotional agencies) would need to map out a comprehensive plan to address the schools' concerns; and second, the schools should establish some form of industry-wide platform (e.g. form an association) to identify common needs and develop areas of collaboration. Annex 3 discusses the developmental challenges and proposed changes in detail.

Corporate Training Centres and Executive Education

35. **Importance of the segment.** There are approximately 6,000 MNCs in Singapore, of which at least half have regional responsibilities, which include training of manpower for their regional operations. Training is becoming a key strategic investment, as companies realise the importance of human capital as a competitive differentiator. In a survey of 98 MNCs based in Singapore (EDB, 2000), it was reported that more than 75% of the companies provide training to their own employees in technical and operational skills, management, or soft skills. 68% of the companies reported that they would be increasing

usage of online training resources in the next few years. This augurs well in terms of positioning Singapore as a hub for face to face corporate training, and for developing and managing online training for the region.

36. **Market opportunities.** The global corporate training market was estimated at US\$280b in 1999, and expected to grow to US\$365b by 2003 (Merrill Lynch, 1999). In the U.S., the number of corporate universities has increased from 400 in 1990 to 1600 in 2000 (Business Times, 2000). The modalities of corporate education have matured over time – while most companies run their training for their own employees as a cost centre, some companies have set up autonomous training centres, some even as for-profit entities (e.g. Shell). Yet other companies have outsourced their training to specialised training providers such as Forum Corporation (part of the Pearson Group). In addition, there has been the proliferation of executive education worldwide, offered by public and private institutions as well as companies.
37. **Proposed strategy.** MNCs should be encouraged to establish regional training centres in Singapore as part of their Asia Pacific or South East Asian regional headquarters activities, while reputable institutions should be encouraged to provide high quality short-term executive training programmes. Both these activities would bring in significant numbers of corporate executives to Singapore. There could be 2 angles in engaging the MNCs: training for domestic operations' capability development and training of regional executives as an economic activity beneficial to Singapore. In addition, these corporate programs could leverage on the eLearning companies in Singapore to offer "blended" courses (combination of online and face-to-face) to the region. Exporting corporate education through eLearning is expected to grow rapidly because of the 'anytime, anywhere' advantages of online learning.
38. **Developmental hurdles.** Many corporate training centres in Singapore are fairly lean, i.e. they usually have a small full-time administrative team, leverage internal trainers or freelance professional trainers, and use hotel facilities to conduct training. Companies are not keen to invest in permanent training facilities, because of cost considerations or lack of economies of scale. In the sphere of executive education, there may be a need for more faculty from overseas. Annex 3 discusses the developmental challenges and proposed changes in detail.

Prep and Boarding Schools

39. **Importance of the segment.** There are 2 major components in this segment: the MOE public schools with significant numbers of boarders, and the private international schools (e.g. Australian International School and United World College) who take in children of foreign executives based in the region. There are more than 520,000 students enrolled in the public schools (primary to pre-university levels) and international schools (MOE, 2002). Current international student enrolment in secondary schools and JCs is about 5% (MOE, 2002). There has been increasing international demand for spaces in the local schools, e.g. ACS Independent has had to turn away at least 150 good international applications each year. This segment serves as an important feeder into the other educational institutions in the ecosystem.
40. **Market opportunities.** Our assessment is that given a liberalized environment, we could build a continuum of local and foreign preparatory schools, catering to both local and overseas students. This is scope to increase the number of international students who are studying here, especially if the international schools could enroll local students as a base-load. For the public schools, there is scope to enroll more international students, provided that local needs are met first. An increased international student presence in the public schools would also expose the local students to cultural diversity.

41. **Proposed strategy.** We could position Singapore as a location for high quality preparatory and boarding education, feeding into higher education institutions. In January 2002, MOE announced a review of Junior College (JC) and Upper Secondary Education to provide more choices to cater to the different talents and aspirations of students. One of the terms of reference is to study whether privately funded secondary schools are necessary and can play a useful role. The path forward is to float the ideas encapsulated in this paper to the MOE review committee (which is expected to be completed by end 2002), with the objective of assessing the merits of an open educational system at the secondary and pre-university levels whereby local and foreign students can attend local or foreign schools of their choice.
42. **Developmental hurdles.** The current hurdles are threefold. First and foremost, this is a highly regulated segment. While we recognise that national education objectives are paramount, our view is that there is scope to move towards a more market-driven environment, especially in terms of diversity of schools. The second hurdle is the cost of land as compared to other regional countries, which means that the fees here would be higher. Third, there may be a shortage of qualified teachers, especially for an international school-type of curriculum (all our teachers today are produced by a single institution, NIE, with a focus on public school education). Annex 3 discusses the developmental challenges and proposed changes in detail.

eLearning and educational support services

43. **Importance of the segment.** This segment includes services such as education promotion, eLearning, publishing (i.e. of textbooks and teaching materials), content production, testing and assessment services, and licensing and franchising. Some of these services are highly exportable (e.g. eLearning, testing and assessment, and franchising). Revenue from exporting these services will contribute VA to Singapore's economy.
44. **Market opportunities.** We have identified two sub-segments as having strong growth potential: eLearning as well as testing and assessment. The global eLearning market is expected to hit US\$23b by 2004, with a CAGR of 68% (IDC, 2000). eLearning is both a vertical and horizontal industry, i.e. there are pure plays that deal directly with the end users (e.g. SmartForce), while there are players that are enablers for brick and mortar institutions (i.e. the eLearning companies provide the technology and content conversion services to help schools distribute their content online). Increasingly, educational institutions, from schools to executive education providers, have reported that a blended approach (combining face to face and eLearning resources) can maximize learning effectiveness. eLearning adds an export dimension to brick and mortar institutions' offerings, as it allows easy access to hitherto untapped markets. The testing and assessment industry is an estimated US\$5.1b industry in the U.S. alone (Eduventures, 2001), with good scalability and export potential (e.g. Kaplan, ETS). Singapore's reputation for educational quality and examination standards is second to none in the region (e.g. the home-grown PSLE standard), and could be licensed overseas.
45. **Proposed strategy.** Both eLearning as well as testing and assessment are emerging industries. This offers an opportunity to grow a rich continuum of players, both local and foreign, big and small. In particular, there is a need to promote and commercial innovative technologies and business models, that are readily scalable for a regional or even global market. Local companies can be groomed into global brands. Due to relatively high costs of developing a complete eLearning service, service providers could outsource low-end capabilities (e.g. courseware scripting) overseas and focus on high-end capabilities in Singapore (e.g. instructional and courseware design).

46. **Developmental hurdles.** Because the eLearning as well as testing and assessment industries are relatively young, the market is fairly immature (especially on the domestic front), both on the demand and supply ends. On the supply side, there is a need to nurture the local startups while also attracting the global names to conduct high value-added activities in Singapore. On the demand side, there is a need to actively promote adoption as well as orientate the companies towards a regional audience. Annex 3 discusses the developmental challenges and proposed changes in detail.

Economic Benefits

47. After running through several scenarios, a possible profile of Singapore's education industry in 10-15 years' time could be as follows:

- **Economic contribution:** From the current annual 1.5% of GDP to an estimated 3 to 5% of GDP. This would arise from student expenditure on living and personal costs, and institutional expenditure on offering the educational services.
- **Employment:** An incremental 22,000 jobs (estimated), of which 13,000 would be teaching-related, and 9,000 would be in the administrative, managerial and specialist areas.
- **Foreign student enrolment:** An incremental 100,000 full-time international students and 100,000 foreign executives (each undergoing an average of 1 week of training in Singapore). This would be over and above the existing stock of 50,000 international students in Singapore.

48. According to the projections, the Tertiary segment would be the biggest incremental contributor to the economy, followed by the Commercial and Specialty schools, Corporate Training Centres and Executive Education, and finally the Preparatory and Boarding schools.

Reality Check

49. Australia's and U.K.'s experiences (i.e. their GDP contributions of education) show that the above targets are not improbable, especially for a non-primary production economy like Singapore. Each country has over 100,000 full-time international students. In the tertiary sector, the scenario projects for 5 additional universities. This is comparable with Victoria State in Australia, which has a similar population to Singapore and supports 8 universities and 40 smaller colleges. The Boston area similarly has 65 universities and colleges and a similar population to Singapore, and a very large number of students from outside the New England area.

Cross-segment Recommendations

50. The following key recommendations cut across most segments:

- **Concerted approach in developing all segments:** This has two parts: first, attract high quality foreign players; and second, develop local industry (e.g. building up the promising local enterprises into regional giants). It has been suggested that in the initial stages, 60% of government resources could be devoted to attracting high quality foreign players to create opportunities for transfer of knowledge to local players, while 40% of the resources could be spent on grooming the local players. This two-prong approach would ensure that a world-class community of companies could develop.
- **Establish a quality assurance system**, in particular focusing on the tertiary and commercial schools segments. This would need to cover admission standards and transparency in evaluating courses. This could be a privately-run non-profit entity, similar to the accreditation agencies in the U.S. It is suggested that a separate task force, comprising representatives from MOE, EDB and the private sector be convened to review the specifics of this initiative.
- **Manpower.** A critical component in the strategy would be to ensure that there are sufficient teachers, faculty members and other professionals to meet the increased demand from educational institutions. A short-term strategy could to recruit talent from overseas, while for the longer term, we would need to increase the local training capacity. MOM, MOE, EDB and NIE should collaborate on a detailed manpower plan to address this issue.
- **Establish an Education Promotion Agency**, which can be co-managed by EDB and MOE. This would serve as a centralised agency with overseas offices to **attract international students to study in Singapore**, a la the British Council and USEIC. This agency could potentially provide placement services for graduating students as well.
- **Visa requirements.** To attract international students for all segments, the relevant government agencies (including SIR) should revisit student visa requirements and the application processes.
- **Competitive institutional land pricing** for Tertiary and Prep and Boarding schools segments, and the selection of suitable site options.
- **Export branded Singapore schools and institutions, curriculum (e.g. mathematics) and testing services.** In particular, we need to leverage on Singapore's strengths as perceived internationally, e.g. in logistics management, hospitality management, language training and safety and security. As regionalisation would be critical in strengthening the Singapore-anchored educational institutions and in diversifying their income streams, IES and EDB could work with key private and public sector educational providers in mapping out how an 'external wing' initiative could complement the Singapore-based activities. In particular, there is a need to develop country-specific strategies for key markets such as China.
- **Additional support facilities and services** (e.g. housing and health insurance) would be needed for the increased numbers of international students. The government could ensure a basic level of provision, while leveraging on the private sector to meet the bulk of the increased demand.

Social Issues

51. Beyond the economics of developing education as an industry and driver of economic growth, we acknowledge that the recommended measures would have an impact on Singapore as a society. We have identified 3 issues for further deliberation:
- **Social assimilation.** Can Singapore absorb the incremental 100,000 full-time international students without adverse social issues? Our sense is that Singapore is already a cosmopolitan and open society, and these students should be able to assimilate into Singapore society, be it for the duration of their studies or, on a selective basis for the talented students, staying on to work upon graduation. One key consideration is the quality of educational services offered, i.e. if we build up Singapore's reputation for offering good quality educational services, this would attract good international students, which means social integration would be less of an issue.
 - **High international to local student ratios in some schools.** Because the distribution of international students is biased towards the tertiary and commercial institutions, there could be schools where international students outnumber local students. This is an issue to be managed at the institutional level as it would be in the institutions' interest not to have one nationality dominating the enrolment in a particular course. One possible positive spin-off is that the local students attending such schools would have a rich international experience.
 - **Downstream implications.** If university cohort participation rate goes up, would there be enough jobs for the increased number of graduates? Related implications are whether graduates' aspirations could be met, and whether the increased number of graduates would impact the job opportunities downstream for the polytechnic graduates? Our preliminary assessment is that job availability is tied very much to economic structure and potentially, and a higher university CPR could establish the manpower pipeline to expedite Singapore's transition to a knowledge-based economy.

Conclusion

52. The Singapore education industry has registered good growth – an annual average of 6% over the past 5 years. This has come about through increased spending by the public and private institutions. By and large, the public institutions have focused on capability and manpower development, while the private institutions have focused on meeting market needs. Going forward, the question arises of whether the public and private sectors should work together to grow the industry in a more deliberate and holistic manner. Since 1986, other countries such as Australia and Malaysia are investing resources to build up their schools to cater to domestic and overseas demand.
53. Our assessment, backed up by comments from institutions and echoed by the community, is that education is an area that Singapore can take a commanding regional position in, and build into a substantive engine of growth for our economy. Along the way, we would also inevitably create a more vibrant education scene for Singaporeans and enhance our position as a magnet for global talent. This we can do provided we are willing to promote our education scene to allow the market and private sector to play a significant role (albeit with good quality assurance systems).
54. The risk involved in promoting the sector is mitigated to some extent by “dreaming big but starting small”, going ahead with a small number of private universities (could be local or from US, UK or Australia), and allowing the establishment of private branches by reputable local schools.

ANNEX 1

WORLD CLASS UNIVERSITIES (WCU) PROGRAMME FACTSHEET

1998 **Massachusetts Institute of Technology (MIT)**'s collaboration with Singapore's National University of Singapore (NUS) and Nanyang Technological University (NTU) was announced in Nov 1998. This Singapore-MIT Alliance (SMA) aims to set a new standard for global engineering education and research and will boost the promotion of technopreneurship in Singapore.

SMA will conduct five graduate research and educational programmes advanced engineering in Singapore to inculcate in students and staff the intensity, creativity and entrepreneurial spirit that is central to MIT's excellence. It will position Singapore as Asia's hub for high-quality graduate education, and prepare young engineers to be leaders in a technologically advanced economy.

Two programmes in Advanced Materials and High Performance Computation for Engineered Systems were launched at NUS in July 1999. The third programme (Innovation in Manufacturing Systems and Technology) was launched at NTU in July 2000. The 4th and 5th programmes (Computer Science and Molecular Engineering of Biological and Chemical Systems) were launched at NUS in July 2001.

Johns Hopkins has set up Johns Hopkins Singapore (JHS) in July 1998 to focus on collaborative research and medical education, and Johns Hopkins – NUH International Medical Centre in October 2000 to pursue academic medicine. Johns Hopkins' flagship Asian facility in Singapore enhances Singapore's efforts to be a vibrant medical hub with the establishment of its flagship Asian facility.

JHS, headed by Prof. Paul Lietman, will collaborate with NUS and National University Hospital (NUH) on research focusing on diseases prevalent in the region. Twelve projects have been identified and started, including cancer treatment and diagnosis, complex lipid disorder diagnosis, artificial liver design and medical IT. The R&D centre's deliverables within five years include hiring about 75 researchers and producing scientific advances leading to patents, spin-off companies and international conferences in Singapore.

Johns Hopkins will be offering PhD and Masters programme in clinical research in Singapore. It will also collaborate with NUS to offer other educational initiatives such as medical officer and post-graduate training programmes, continuing medical education courses, nursing and other allied health training programmes.

The Johns Hopkins – NUH International Medical Centre is a joint venture between NUH and JHS. This centre for academic medicine will provide advanced patient care for local and foreign patients and serve as one of the key centres for clinical research. In addition, the centre will educate and train clinicians and other allied healthcare professionals. The intent is for Johns Hopkins to replicate in Singapore its model of medical excellence built on the synergy arising from the integration of clinical services with research and education.

1999 **Georgia Institute of Technology** collaborated with the NUS to set up The Logistics Institute – Asia-Pacific (TLI-AP) in Singapore in 1999. TLI-AP has conducted 5 professional education and training courses in logistics and supply chain management. An 18-month dual Masters programme in logistics started in July 2001, in which students will obtain two Masters degrees, one from NUS and another from Georgia Tech.

TLI-AP has adopted the highly successful leaders in logistics programme where sponsoring companies provide TLI-AP with financial support and work with TLI-AP on research projects. Thus far, TLI-AP has managed to attract 9 members including HP, UPS, MSAS, BAX Global and Circle into the programme.

TLI-AP has also implemented a research programme in global logistics, covering areas of particular relevance to the Asia-Pacific such as air and sea cargo transportation, petrochemical manufacturing supply chain and e-logistics. This co-operative effort will enhance local logistics capabilities and further strengthen Singapore's outstanding logistics infrastructure, firming securing the city's position as the gateway to Southeast Asia.

The Wharton School of the University of Pennsylvania has set up the Wharton – SMU Research Centre as part of the overall agreement between Wharton and Singapore Management University (SMU) to collaborate on academic development and research. It will focus on business research related to Singapore and the Asian region, notably technological innovation, entrepreneurship, the management of technology, e-commerce and knowledge transfer within organisations.

Professor Janice Bellace, President of SMU, will be the Centre's first Director. Faculty from Wharton working from the Centre in Singapore will co-supervise MSc or PhD research. The Centre will develop research expertise that can be utilised by the industry, through avenues such as executive education, publication of research findings targeted at the needs of the industry and providing consultancy services.

2000 **INSEAD** has made the largest investment in Singapore so far. It is Asia's first international business school with a full campus. Its \$60 million facility at the Science Hub was inaugurated on 23 October 2000. The 2.9 ha campus will be a centre for world-class teaching and research activities, including MBA programmes, executive programmes and Asia-related research.

The school launched its full-time MBA programme in Singapore in Jan 2000, attracting some of the best executives and students from around the world. These students come from 26 different countries and have GMAT scores comparable to students in some of the top business schools in the U.S. About 1,500 executives from the region are also expected to attend INSEAD's executive education programmes in Singapore this year, helping to anchor Singapore as the regional hub for education. In addition, multinational corporations will also use Singapore as their regional training base for their managers, leveraging on INSEAD's resources.

Eventually, the Singapore campus will increase its annual MBA enrolment to 600. The annual intake for its executive education programme will also grow

to 5,000. By then, the Singapore campus will have 80 full-time resident faculty members.

The University of Chicago Graduate School of Business is the first leading US business school to have a permanent campus in Asia with the opening of its new facility in September 2000. The campus, located at the House of Tan Yeok Nee, a 112-year old traditional Chinese residential building in the city, is refurbished at a cost of \$12 million.

University of Chicago will offer an International Executive MBA programme, to be taught in 16 one-week modules spread over 19 months. This format allows business executives from the Asia-Pacific to continue working full-time and to travel to Singapore to attend classes for intense periods of group study. The first intake of 85 students started their class in September 2000 and will be taught by the same faculty that teaches at the school's Chicago and Barcelona campuses. This will be the first time a business school will offer a globally integrated executive MBA programme on three continents taught entirely by its regular faculty at permanent campus locations.

2001

Technische Universiteit Eindhoven (TU/e), the Netherlands, has partnered NUS to set up the Design Technology Institute (DTI) to train future leaders in Product Design & Development and to conduct research and education on Design Technology. DTI aims to train engineers who are able to translate technical concepts into real products efficiently in line with time driven, competitive markets, and to marry form and function across several domains early in the design process.

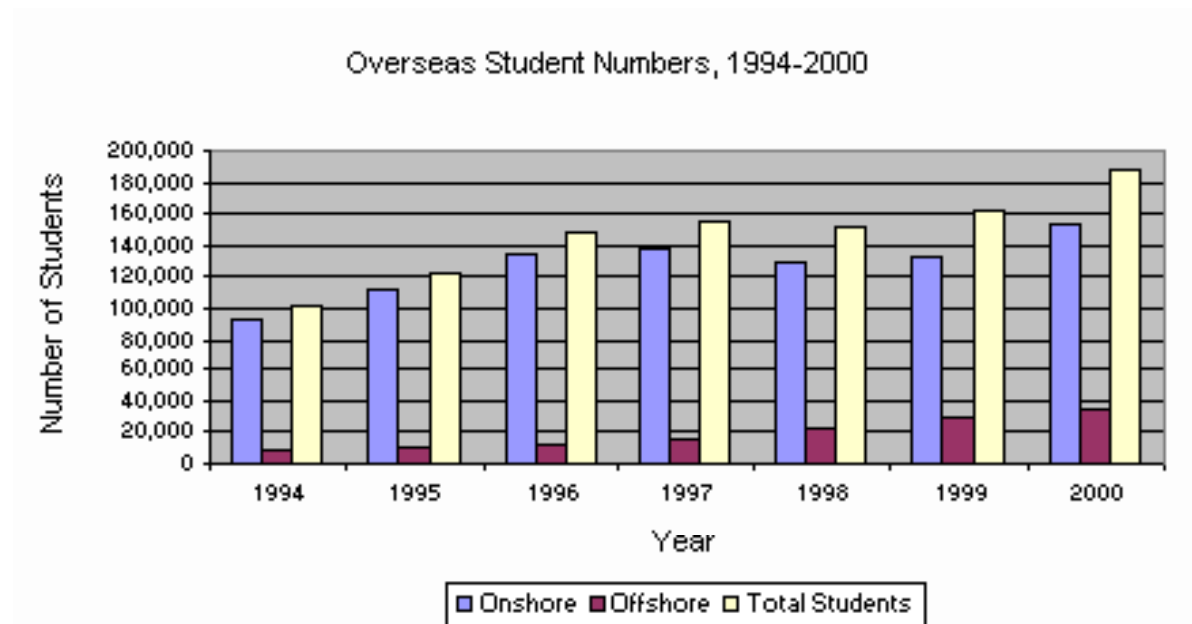
DTI will offer a Master of Technological Design (MTD) degree, which targets to attract and develop talent in design technology. It will adopt a different approach from the existing MSc and MEng programmes. The joint MTD programmes are modelled after an existing, prestigious MTD programme awarded since 1988 by TU/e and will focus on the three strategic areas - Rapid Product Development, Mechatronics and Embedded Systems. The two-year programme comprises one-year coursework and one-year fieldwork in an actual industrial project, jointly supervised by the DTI and industry. The Institute aims to produce 9 PhD, 20 MEng and 36 MTD each year.

2002

Technische Universität München (TUM) and NUS sealed a landmark venture with the Technical University of Munich (TUM) to establish a joint Master's degree in Industrial Chemistry. The programme will be run as part of the German Institute of Science and Technology (GIST).

TUM is a well-recognised European leader in science and technology education and research, with strong links to industry. In particular, it is a powerhouse in chemistry research with a long tradition of excellence including five Nobel laureates in Chemistry. Its close links with the German chemicals industry makes it an ideal partner for NUS especially in boosting collaboration with industry.

In line with Singapore's goal to become a leading chemical sciences hub, the new program will meet demand for graduates with specialised skills for the fast growing chemical industry. The curriculum will emphasise practical skills and incorporate business and management concepts.

ANNEX 2**OVERSEAS STUDENT NUMBERS IN AUSTRALIA**

ANNEX 3

DEVELOPMENTAL HURDLES AND RECOMMENDATIONS

1. Tertiary Education

Challenges	Requirements			Recommendations
	Human Resource	Infrastructure and Facilities	Land	
<p>Undergraduate</p> <ul style="list-style-type: none"> The 3 existing universities (NUS, NTU & SMU) are focused on providing a public good R&D efforts, and capability development, and may not be able to attract large numbers of fee-paying international students. 	High	High	High	<ul style="list-style-type: none"> Invitation of High Quality Institutions to set-up in Singapore. Or Open gates for Universities to set-up, but with tiered accreditation to peg quality. Government funding for local students at private universities – This is to ensure a level playing field between the public and private universities, e.g. through a voucher system. One key consideration is that the system should not erode teaching of “expensive” subjects like physical sciences and engineering or undermine spending on research – one option to consider is the use of vouchers of different value according to the subject and the extent to which the service provider engages in research. Visa – some monetary guarantee, some academic standard gatekeeping, and good service turnaround.

				<ul style="list-style-type: none"> ▪ Land pricing for competitive development of universities. ▪ Insurance for students onshore in Singapore, for instance, health and medical insurance. ▪ Harmonise policy changes with all agencies involved, through EDB/ERC. ▪ Creating a transparent and level playing field (cost structure, especially land, cap on international students) for the sector, with buy-in from NUS and NTU. There should be proper and transparent accounting for NUS's and NTU's research contributions.
<p>Postgraduate</p> <ul style="list-style-type: none"> ▪ Most postgraduate <u>research</u> students in NUS and NTU are on full-sponsorships, which is a global practice. ▪ Low volume as compared to undergraduate programs. However, professional postgrad programs could possibly offer higher value add per student. 	<p>Shortage of local faculty, and difficult to attract foreign professors.</p>	<p>Medium – High, depending on the discipline</p>	<p>Low</p>	<ul style="list-style-type: none"> ▪ To continue sponsorships for capability development areas. ▪ Professional Master's programs (e.g. MBA) can target full-fee paying international students. ▪ National Research Funding Masterplan that encourages collaborative research between institutions located in Singapore. ▪ Review of personal tax regulations, to ensure that they are internationally competitive in attracting top faculty. If need be, to introduce tax incentives to enhance talent attraction.

				<ul style="list-style-type: none"> Use of existing incentive schemes to facilitate infrastructural development.
--	--	--	--	--

2. Commercial & Specialty Schools

Challenges	Requirements			Recommendations
	Human Resource	Infrastructure and Facilities	Land	
<ul style="list-style-type: none"> Fragmented market of providers. Quality of providers is fairly uneven. Relatively high operating expenses, especially on office rental. Some schools (e.g. NAFA) face caps on international students, as well as visa problems. Stringent regulations on part-time work for international students. Providers not allowed to develop and offer their own degrees. 	Can use local teaching staff	Low (especially for soft skills courses)	Low	<ul style="list-style-type: none"> Strategy: Attract high quality foreign service providers and to groom local schools. Build diversity by attracting and nurturing good institutions in various disciplines and special interests. Implement quality assurance to help providers upgrade their offerings. This could involve the government authorities providing endorsement on their respective areas of specialty, e.g. MAS could endorse financial training providers, or SPRING could endorse call centre training. By involving the government authorities to provide endorsement, the service providers will be incentivized to offer high quality course offerings, and attract students of desirable quality. Provide scalable shared infrastructure (e.g. EduMall Concept whereby commercial schools have share classrooms, libraries

				<p>and recreational facilities).</p> <ul style="list-style-type: none">▪ Allow working professionals increased tax breaks for undertaking studies (this would boost demand in the continuing education market).▪ Review visa regulations, to see whether flexible work-study arrangements are feasible (e.g. a part-time study visa that allows foreign students to work 50% of the time).▪ Encourage the private schools to collaborate with industry and create both demand and supply for specialty courses and programmes.▪ Potential niche areas:<ul style="list-style-type: none">▪ Logistics▪ Language▪ IT▪ Healthcare▪ Safety and Compliance▪ Call Centre – language and process oriented▪ Hotel / Hospitality▪ Banking, Finance, Insurance
--	--	--	--	---

3. Corporate Training and Executive Education

Challenges	Requirements			Recommendations
	Human Resource	Infrastructure and Facilities	Land	
<ul style="list-style-type: none"> Cost of permanent training facilities 	<p>Corporate Training: Can tap on existing industry practitioners.</p> <p>Exe. Education: Need foreign professors</p>	<p>Corporate Training: Minimal</p> <p>Exe. Education: Low</p>	<p>Corporate Training: Minimal</p> <p>Exe. Education: Low</p>	<ul style="list-style-type: none"> Look into setting up shared & scalable training facilities, e.g. Education Park Concept, whereby a private provider could build shared facilities for lease to the corporate institutes. Companies can further utilise existing office premises and facilities. For example, a hotel could set-up a hospitality and corporate training centre using the hotel's existing premises and facilities. Raffles International Training Centre is one good example. Broaden the scope of MNCs' activities in Singapore by encouraging them to build their Asia Pacific training headquarters. Targets can include corporations with strong brand recognition (e.g. McKinsey Institute and McDonalds' Hamburger University) as well as the many training centres of MNCs with RHQs in Singapore (e.g. Siemens and Shell). Can also encourage the local GLCs (e.g. DBS and SIA) to be more active in this area, and offer their training services to external parties. Encourage collaboration between corporate

				training centres and local universities. For example, applied research and developing joint training programmes.
--	--	--	--	--

4. Prep & Boarding Schools

Challenges	Requirements			Recommendations
	Human Resource	Infrastructure and Facilities	Land	
<ul style="list-style-type: none"> ▪ Current educational regulations require Singaporeans to attend national schools. ▪ High cost of land, which translates into higher fees as compared to other boarding schools in the region. ▪ Shortage of qualified teachers. 	Moderate to High	Moderate	High	<ul style="list-style-type: none"> ▪ MOE to review the secondary school segment, and study whether a more open market-driven environment is feasible. ▪ If foreign private schools, which are offering different education programmes and syllabuses, are allowed to admit local students, the local student base load will attract more foreign players to Singapore. In addition, our students have more choices. ▪ Land pricing for competitive development of private prep and boarding schools. ▪ Encourage better utilization of school facilities. Schools, especially those which are operating single session, should be allowed to rent out their facilities to other education service providers in the afternoons and school vacations. ▪ In the short term, we need to attract high quality foreign teachers. For the long run,

				need to train more local teachers for both the public and private schools.
--	--	--	--	--

5. eLearning & Supporting Services

Challenges	Requirements			Recommendations
	Human Resource	Infrastructure and Facilities	Land	
<ul style="list-style-type: none"> Current eLearning industry is young, fragmented and relatively undeveloped. Even the top names in the U.S. are still relatively small. 	Need people for content development, especially on the higher VA activities such as instructional design	Low	Nil.	<ul style="list-style-type: none"> Anchor the big global names (e.g. U21global, Blackboard and Kaplan) to carry out substantive RHQ and development activities here. This must be supported by strong efforts in developing our local players. Promote collaboration between these big names and local companies Create a greenhouse for the SUEs (both local and foreign), e.g. through an information clearinghouse between the government agencies. Encourage brick and mortar institutions to leverage on eLearning to reach external markets. Outsource primary & secondary testing to separate agency with mandate to export services to the region.
<ul style="list-style-type: none"> Testing and assessment is controlled by the Ministry of Education 	Low	Low	Low	

