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The Future of Skill Formation in Singapore

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Introduction

In thirty years Singapore has been transformed from an equatorial entrepot into one of the world's most competitive economies. Its economy grew at an average of 9.1% between 1960 and 1990. Its GNP per capita increased from S\$435 in 1960 to S\$26,475 in 1997 taking it above France, Sweden, Hong Kong and the United Kingdom. The economic success of Singapore and the other Asian Tiger economies most notably South Korea, Hong Kong and Taiwan, were seen to be closely connected to the development of their human resources. The outstanding performance of Japan and the Asian Tigers in international tests in Mathematics and Science is assumed to confirm this view: Singapore is frequently top in both subjects. For the authors of the World Bank report *The Asian Miracle* there was little to add to the explanation that it was the quality of the workforce that held the key to explaining the success of these economies, but other analysts pointed to the crucial role of the 'developmental' state in orchestrating the exponential economic development in these countries, 'A state is developmental when it establishes as its principle of legitimacy its ability to promote and sustain development, understanding by development the combination of steady high rates of economic growth and structural change in the economic system, both domestically and in its relationship to the international economy' (Castells, 1996: 182).

The purpose of this paper is not to engage in a detailed historical analysis of Singapore's economic development as there are now a number of good accounts but rather to examine the issues, challenges and prospects for Singapore in light of economic globalisation, technological change, and the Asian financial crisis.¹ This crisis led many Western commentators to predict a global convergence based on the Anglo-Saxon model of market capitalism. Such a convergence is also predicted because globalisation is assumed to lead to a significant decline in the powers of the nation state to control the fate of their economies apart from investment in education, training and economic infrastructure, including transportation, communications and the environment.

Such arguments make Singapore an important case study because it is one of the most 'open' economies in the world as it exports virtually everything that it produces and imports virtually everything that it consumes, including drinking water (Chua, 1999). It is the world's most trade dependent economy accounting for 93 per cent of its GDP.² Its whole economic strategy has depended on attracting inward investment from leading MNCs, and approximately two-thirds of jobs in Singapore depend on this kind of inward investment. Following the logic of the global convergence thesis, which can be found on both the political left and right, we would expect Singapore to significantly reduce the role of the state to meeting the investment needs of global business. We would also expect to find a human capital model of labour market flexibility based on the meshing together of the rational interests of individuals and companies with little state interference (Wade, 1990).

This paper will show that we need to move beyond the state v's market and the strong v's weak state found in both the popular and academic literature. For although the state will continue to play a vital role in Singapore, there are significant limitations placed on its actions by its own brand of developmental capitalism. These challenges not only stem from the Asian financial crisis and the continuing integration of the world economy, but from the consequences of a second industrial transformation, where the 'learning' model of the mass production of goods and services has become a source of 'trained incapacity' in a knowledge-driven economy.

Here Singapore confronts the same problem as other 'later developers' who have relied on the grooming of 'expert followers' who have achieved spectacular economic growth through what Alice Amsden has called the 'paradigm of late industrialization through learning' (1989:4). Economies commencing industrialization in the twentieth century transformed their production structures and raised their incomes per capita on the basis of borrowed technology and the systematic technical training of the workforce as Amsden suggests, 'If industrialisation first occurred in England on the basis of invention, and if it occurred in Germany and the United States on the basis of innovation, then it occurs now among "backward" countries on the basis of learning' (Amsden 1989:4).³

The study of skill formation in Singapore at the beginning of the twentieth-first century is, therefore, the study of post-industrial changes in our understanding of the global, national, local and personal (Ball, 1998). Block (1990) argues that the task is to map the patterns and characteristic conflicts of the emergent postindustrial or knowledge-driven societies and to show 'how these observable patterns conflict with the system of categories that has organized social life in the industrial period' (p.13). Thus, the question of how Singapore is attempting to move towards a 'knowledge' economy is a focal concern of this paper.

The paper is divided into two sections. In Section One we trace Singapore's economic strategy over the last forty years and how this has shaped its skill formation strategy, along with a 'new' model of the worker-citizen. The Second Section examines the challenges now confronting Singapore in its attempt to become a knowledge-driven economy. Here we will examine four key 'pressure points' which confront all the developed economies in albeit different ways (Brown, 1999).⁴ Firstly, how the nation state seeks to legitimate its role in skill formation in the context of economic globalisation? Can the role of the 'developmental' state be maintained? Secondly, whether the strategies and policies for upgrading the skills of the workforce can contribute to learning, innovation and productivity in a knowledge-driven economy? Thirdly, can the 'positional' competition for education, training and employment be organised in ways which contribute to equality of opportunity and social inclusion? What is the foundation of social cohesion? and; finally, can the education and training system succeed in modelling a new worker-citizen?

Section One: From Entrepot to Knowledge Economy?

Skill formation in Singapore is central to its political viability as a city-state. Singapore gained independence from British colonial rule in 1959. It had remained economically underdeveloped, but the British did leave a viable public administration and the English language. Both proved to be important facets of Singapore's subsequent development. Linda Low (1998) argues that the years between 1959 and 1963 (when it entered the Malaysian Union only to be evicted in 1965) were decisive in shaping the direction of the governing party, the People's Action Party (PAP) which continues to control the reins of political power forty years later. As we were told 'Singapore is not like a typical government, governments come and go!'. The PAP did not adopt the laissez faire approach of the British as the PAP was founded as a socialist party (Low, 1998). Moreover, unless the PAP could build social cohesion, communist antagonists and ethnic tensions would undermine its political power base, a view crystallised by race riots in 1964.

The PAP succeeded in building social cohesion on the basis of economic nationalism, where prosperity for all was to be pursued through national economic development. The PAP rationalised this approach around the 'ideology of survival'. The geopolitical vulnerability of Singapore was used to reinforce the message that the world does not owe Singaporeans a living. They must pull together to improve their economic competitiveness. This sense of national survival remains strong given a widely shared belief that its powerful neighbours would not offer favourable terms if Singapore failed to survive as a viable city-state. Singaporeans frequently recite the fact that virtually at take-off from Changi Airport you enter Malaysian or Indonesian airspace.

A further ingredient of the PAP ideology of survival concerns the organisation of political leadership. As Beng-Huat Chua has asserted the ideology of survival was used to promote the idea that 'the population must be transformed into a tightly organised and highly disciplined citizenry all pulling in the same direction with a sense of public spiritedness and self-sacrifice in the national interest...as part of the disciplining process, possible bases for organised sectional interests had to be controlled, the most significant of which was the subordination of the trade unions to the PAP government' (1995:18).

The PAP defined itself as the 'trustee' of the nation, making demands on the stakeholders (Singaporeans) in anticipation of a healthy return on their investment of energy, skills and commitment. Democratic freedoms were traded for improvements in material prosperity. Almost every facet of social and personal life has been subject to government regulation for economic ends. But in return as a senior advisor observed, in creating a surplus, 'you distribute the goodies. This makes the people

beholden and then it pulls up the economy'. As this 'settlement' began to deliver economic fruits the PAP attempted to de-politicise the administration of 'Singapore Inc'. It argued that the role of government is largely technocratic, ensuring that sectional interests are held at bay whether these stem from employers, professional groups, trade unions or ethnic rivalries.⁵ But equally the 'developmental' state in Singapore has been presented by its chief architect Lee Kuan Yew as a system that should not be meddled with, as Senior Minister Lee Kuan Yew once remarked, 'Singapore is man-made and can be easily unscrambled. We move away from certain basic values and principles, and Humpty Dumpty will never be put together again'.⁶

Competitive strategy

As rising prosperity for all could only be achieved through a process of moving the workforce up the 'value chain' of economic activities, skill formation issues were at the core of its competitive strategy. Hence the question of economic competitiveness and that of the role of the state in upgrading the skills of the workforce, are understood in almost identical terms by all policy stakeholders in Singapore. This consensus is based on the view that economic development cannot be left to the operation of the global market place, as Philip Yeo, CEO of the Economic Development Board (EDB) observed, 'our government has always been a development capitalist'.⁷

In the early days a major economic problem was that there was little scope for import substitution favoured by other Asian economies such as Japan and South Korea, given its small population. Following the demise of its brief federation with Malaysia (1963-1965), it had to look externally for both inward investment and export markets, based on the recommendations of the United Nations Survey Mission in the early 1960s led by Dr Albert Winsemius (Low et al.,1993). Singapore was an early beneficiary of the multinational companies (MNCs) moving into South-East Asia. Whereas many developed nations are currently grappling with the consequences of an increasingly global labour market, where nations could no longer depend on 'national champions' offering mass employment to the indigenous workforce, this has been a fact of life for Singapore's political elite for decades.

Hence its export orientation was timely. Foreign MNCs were looking to reduce their labour costs by moving low-skill production to Newly Industrialising Nations such as Singapore. The Economic Development Board (EDB) has played a pivotal role in keeping the virtuous circle of economic competitiveness, skills upgrading and rising prosperity, in motion given that 'employers will not skill for the future, only their short-term needs, this is a state responsibility'. The image of Singapore as an open free market economy does not square with much that one finds behind the window dressing. This image is cultivate for the consumption of American companies,

OECD, and World Bank, who adopt a model of Anglo-Saxon capitalism which assumes that a good place to do business must mean a free-market economy. If you meet a Singaporean economist at the National University it is highly likely they have spent time studying in the United States or Britain, and will have bookshelves stuffed with Western economics textbooks, but in the development of economic policy in Singapore most of this literature is not simply ignored but conspicuously violated. A clue to what they call 'strategic pragmatism' (Schein, 1996) in Singapore, can be found in the recruitment of staff to the EDB. In the West such an agency would be full of economists and accountants, but approximately three-quarters of EDB staff were initially trained as engineers, because this is believed to give them a more hands-on approach when talking to companies about investment in Singapore.

In order for the EDB to fulfil its developmental role it became highly skilled at foresight planning that involves scanning the global for companies, inventions and people able to add value to Singapore's strategic initiatives in new or emerging spheres of economic activity. It has regional offices around the world which enables the EDB to develop personal contacts with key corporate personnel necessary to build the trust relations which are often necessary before companies will commit to the inward investment deals that the EDB were interested in attracting. Like other countries the EDB uses a range of incentives including cheap rents, tax breaks, cheap energy supplies, etc., but in Singapore these are invariably linked to a commitment to skills upgrading. This involves the EDB initiating new training programmes at very short notice in advance of MNCs arriving in Singapore to fulfil its commitment to supply skilled labour. The government would typically pay for the bulk of this training on the understanding that more workers would be trained than immediately necessary, using state of the art technologies sometimes provided by the MNCs, but enhanced by major government investments in tertiary education and training provision. The reason for training more workers than strictly required was to encourage the inward investor to expand their operations and to make it easier to attract other companies in the same industrial sectors to enter Singapore in an attempt to create industrial clusters.

The coordinating role of the EDB is only possible when there is an institutional framework of 'joined up' government that includes the education and training system, housing, land and environmental agencies. This allows the EDB to offer a 'one stop' approach, where the inward investor can deal with one person within the Board, responsible for overseeing the business start-up within Singapore. Once in the City-State the EDB works closely with companies to move production or service delivery up the value-added skills chain, which as we will see, now involves helping MNCs to establish low-skills operations in neighbouring countries.

The EDB was very successful in attracting electronics companies from America, Europe and Japan. This contributed to a rise in manufacturing employment from 16.1 per cent in the early 1960s, to an average of 26.4 in the 1970s and 28 per cent in the 1980s.⁸ This early competitive strategy based on attracting low skill, low wage

manufacturing was also motivated by an unemployment rate that stood at 14 percent in 1960. However, within a decade fears about unemployment turned to issues of labour shortages. These led to the import of labour from countries including Malaysia, Indonesia, China and the Philippines. Much of this labour was unskilled making it difficult to encourage employers to upgrade the skills of workers. Attempts to upgrade the workforce were also put on hold following the oil crisis in 1973 and the world recession in the mid-1970s. Unemployment reached 4.6 per cent in 1975 despite the employment buffer provided by the flexible use of foreign workers (Bello & Rosenfeld, 1990).

The decisive move came when the government announced what it called a 'wage correction' policy in 1979 through the tripartite National Wages Council, formed in 1972 to regulate wages and to ensure that all sections of the workforce were able to benefit through economic growth. Labour costs rose by approximately 10 per cent between 1979 and 1984 in contrast to productivity growth of 4.4 per cent (Low, 1998:45). The question of productivity was to be resolved by attracting capital intensive and high skilled employment, with the 'active' encouragement from government to move low wage, low skill jobs out of Singapore. As Ashton et al. (1999) have noted the process of skills upgrading coincided with similar moves in Hong Kong, South Korea and Taiwan in the late 1970s and early 1980s, 'The close timing of events suggests that all four Asia 'tigers' were subject to similar external constraints' in their bid to maintain economic competitiveness (Ashton, et al., 1999: 47).

In Singapore this approach was supported by a levy on low paid jobs, with the money being channelled into the Skills Development Fund (SDF) used to fund a range of training programmes aimed at lifting the skills base of the workforce. This strategy led to fears about the 'hollowing out' of industry, as a leading electronics MNC located in Singapore noted, 'If you take everything away, what is left? So they were balancing on very tight ropes... They were very open in telling you that there is only 3 million people. We can't afford you having thousands and thousands of people in each company. So please re-think what you can put here. We also don't want to force you to pay too high, but because of our limitations we have to push wages up'. This strategy represented a clear example of where the state presented itself as a 'trustee', holding both employers and trade unions at arms length in the 'national interest'.

This attempt to launch Singapore in the direction of a high skills economy had little immediate impact apart from leading to a 40 per cent reduction in new investment and some MNCs moved their low-skilled operations out of Singapore. But the general thrust of the government's policy to upgrade the skills of the economy had been established, and has met with considerable success (See Table 1). This in turn has led to a recognition that for Singapore to maintain its commitment to economic growth and prosperity in the twenty-first century a more fundamental change in the economy and the system of skill formation was required. A view reinforced by the Asian financial crisis. Indeed, the response of the Singapore

government to the Asian economic crisis is instructive to its developmental approach. It did not wait for the miracle drug of the market to lead Asia to recovery.

Table One: Changes in Occupation Composition in Singapore 1987 - 1997 (%)

	1987	1997
Occupational Composition		
Professional and Managerial	12.1	21.5
Technical and Associate Profs	10.5	17.5
Clerical workers	14.1	15.2
Sales and service workers	15.7	12.5
Production & related workers	41.7	29.8
Others	5.9	3.5

Source: Report on the Labour Force Survey of Singapore 1997, Research and Statistics Department, Ministry of Labour 1998 p.ix.

The Asian financial crisis led wage competitiveness in Singapore to deteriorate as the regions economies competed for a 'shrinking economic pie'.⁹ The government immediately imposed to a 15 per cent reduction in wage costs through a cut in employer contributions to the Central Provident Fund (CPF), a compulsory savings scheme, along with wage cuts for all groups of workers based on the principle of collective sacrifice.

As Prime Minister Goh Chok Tong suggested, 'Singapore now, unlike in 1985, is in a strong position to weather this storm. The economy is much more diversified, sophisticated and resilient. Our reserves are strong. We must use this period of economic slowdown to consolidate our strengths, build new capabilities, seek out emerging opportunities and position ourselves to ride the next wave of growth in Asia'.¹⁰ Given a belief that as regional competitors emerge from the financial crisis leaner, fitter and more cost competitive there was a need to 'accelerate the upgrading of our economy' towards a 'developed knowledge economy' (Ministry of Trade and Industry, 1998:10).

The Committee on Singapore's Competitiveness, responsible for examining the implications of the Asian financial crisis concurred, 'We should be a knowledge economy where the basis for competitiveness will be the capabilities and intellectual capital to absorb, process and apply knowledge. We should have a strong technological capability and a vibrant entrepreneurial culture that thrives on creativity, nimbleness and good business sense. To develop into a knowledge economy, Singapore should be an open cosmopolitan society, attractive to global talent and

connected with other global knowledge nodes. There should be a critical mass of Singaporeans who are risk-taking entrepreneurs, innovators and arbitrageurs. Together with the global talent, they will move Singapore ahead in the Information Age.¹¹

However this shift in competitive strategy cannot be achieved without changing the nature of business activity, including the operations of the MNCs. Singapore has adopted a high skills strategy which involved moving low skilled manufacturing out of Singapore to neighbouring countries (growth triangles), whilst using various incentives, to attract high value added manufacturing and services to establish Singapore as a business hub.

In manufacturing, the aim is to focus on industrial clusters given constraints of land, labour and cost effectiveness. The main clusters are electronics (data storage & imaging; computers, communications & consumer electronics; semiconductors; key modules & devices); chemicals (petroleum; petrochemical; speciality & industrial chemicals); and engineering (precision engineering; marine; aerospace; process engineering).¹² The strategy is to move up the value-added chain beyond production to sales, marketing, design and R&D. Knowledge intensive 'sunrise' industries are currently being attracted to Singapore, these including wafer fabrication and biotechnology. An indication of this shift is that two out of every three jobs created in 1997 were for 'knowledge and skilled workers', compared to only half the jobs created in 1995.¹³ The success of this strategy will depend on the development of exportable service clusters including headquarters services; logistics; communication and media; R&D; education; and health-care. These include the management and distribution of financial services, information technology (IT) services, E-commerce and direct marketing. The development of an International Business Hub focusing on these service clusters is anticipated to generate a large proportion of 'skilled' jobs.¹⁴

Indicative of Singapore's current skill formation strategy is the Industry 21 (I 21) initiative launched by the EDB in 1998. It is anticipated that knowledge-driven industries under I 21 will contribute 40% of Singapore's annual GDP, and create 20,000 to 25,000 jobs every year over ten years. Of these two out of every three jobs will be for knowledge and skilled workers in the manufacturing sector; and three out of four in the exportable services sector. 'I 21 aims to develop Singapore into a leading competence centre for knowledge-driven activities, as well as strengthens Singapore as a hub for company headquarters and product charters'.¹⁵ A key part of the investment in the social and economic infrastructure, especially for the IT, communications and media sector is Singapore One, which is a broadband network across Singapore, capable of delivering interactive multi-media applications including access to the Internet and e-commerce (Selwyn & Brown, forthcoming).

Lim Swee Say, Deputy General Secretary of the National Trade Union Congress (NTUC) has identified a key part of this changing relationship with the MNCs. He suggested that Singapore had offered 'an excellent business infrastructure and a

disciplined workforce for them to produce and distribute products and services cost effectively out of Singapore to the global markets. In return, we benefit from not just their foreign capital, but also their technology and global markets. This strategy of 'borrowed technology and borrowed markets' has served us well up till now. However, it is not sustainable. To continue to be relevant to the global companies, we need to broaden and deepen our capability profile. We need to go beyond cost management. We must be able to create value and help generate revenue by getting directly involved in the development of new technology, innovation, production process, market, and management know-how' (1998:42).

The shift to a developed knowledge-driven economy also involves a change in the nature of its developmental strategy. This represents an extension rather than a retreat from the state's role in economic development. Again the financial crisis in Asia has exposed an underlying problem, namely that other regional economies have been upgrading their skill base in order to compete for intermediate skills, at the same time neighbouring economies have experienced a significant decline in their national currencies, which appear to make Singapore look increasingly expensive. It is recognised that the only way to lock foreign MNCs into Singapore is to create a research and design capability that cannot be easily transplanted elsewhere. The development of 'indigenous capability' in more knowledge-intensive manufacturing and services therefore depends in part on rooting the MNCs core value added activities such as R&D, design, marketing and business services in Singapore. As we were told at an interview with the National Science and Technology Board (NSTB), 'when you say indigenous capability, what we mean is that Hewlett Packard, Singapore will not be able to do it elsewhere, the ideas, the decision-making, are all from here. Benefits will be stable, they will not just move their operations away because this is the source - this is the source of new ideas'.

This issue is associated with the long standing problem of what is seen as an over-reliance on foreign MNCs. This has increasingly constrained the government's room for manoeuvre and more seriously, the extent of technology transfer and skill diffusion to local businesses has been disappointing (Ashton et al., 1999: 44). The development of knowledge-intensive activities in manufacturing and service sector clusters, is now part of an attempt to attract businesses to set up headquarters operations in Singapore to help extend the global reach of indigenous businesses and workers. Global networking is seen as essential for ideas, capital, technology, resources and markets. This policy is reflected in the creation of new 'research' universities in niche areas such as business studies, life sciences, etc., to be run by world-class universities in these fields such as INSEAD for management and John Hopkins University for Life Sciences.

'Singapore Inc.' is being transformed into 'Singapore Unlimited'. But this does not signify the rise of the virtual state as characterised by Richard Rosecrance (1999). A more accurate description is of Singapore as a 'one nation, dual economy'. Here the state performs a *vital* role in Singapore, at the same time as performing a *virtual* role

in the region. The developed of an 'external wing' began in the early 1990s with the Singapore government acting as a outward investor in the region. This takes the form of joint ventures with regional governments, MNC or Government Linked Companies (GLCs). The virtual role of the state has become increasingly important in its 'developmental' capacity given limitations of land and labour within Singapore. This approach gives the EDB the flexibility to encourage the development of a business hub or advance manufacturing in Singapore at the same time as participating in setting up low-skilled operations elsewhere within the region; or as we were told 'you keep the brains here, export the brawn'.

There is another rationale for its 'dual' economic strategy that reflects the changing demands of global knowledge-driven enterprise. It is based on the recognition that unlike much of the debate in Britain and the United States, there is a need to create its own 'national champions' precisely because these Singaporean MNCs would give the country a more secure economic footing and enhance its growth potential. Singapore's virtual involvement in the regional economy is a way of developing its own World-Class Companies (WWCs) and Local Enterprises [LEs]. The EDB has identified approximately 300 Promising Local Enterprises to 'accelerate their growth' by offering financial assistance, resource support, image building, technology acquisition, strategic alliances and business partnerships' (EDB, 1998). But this approach is seen to depend on innovation and knowledge-driven entrepreneurial activities that have not been a characteristic feature of the country's skill formation strategy to date.

The Changing Model of the Worker-Citizen

Given Singapore's post-colonial status and civil strife in the 1960s it is perhaps inevitable that the education system was identified as a key institution for social and economic reform. The use of the education system as an instrument of nation building is a feature of all state systems of education (Green, 1990) Yet in the late 1950s children were schooled on the grounds of ethnicity - Chinese, Malay, Tamil and English - which proved to be a major source of political and social tension, as Lee Kuan Yew observed, 'If in the four different languages of instruction, we teach our children four different standards of right and wrong, four different ideal patterns of behaviour, then we will produce four different groups of people and there will be no integrated coherent society. What is in the balance is the very foundation of our society. For if we are not to perish in chaos caused by antagonisms and prejudices between watertight cultural and linguistic compartments, then you have to educate the right responses amongst our young people in school'.¹⁶ Lee Kuan Yew's response was to institute a bilingual policy where students would be educated in English and their 'own' language given that the population is split 77 per cent Chinese, 14 per cent Malay, 7 per cent Indian and 2 per cent other.

Lee Kuan Yew also understood that political stability in Singapore was not simply a matter of the direct survival of the PAP, but that MNCs would only invest in the country if stability could not be guaranteed. There was also an urgent need to ensure that the potential workforce for the MNCs as literate, numerate and well disciplined. Again he saw this as a task for a state system of education 'We must have qualities of leadership at the top and qualities of cohesion on the ground. This pyramidal structure of top leaders, good executives, well-disciplined civic-conscious broad mass can only be produced by our education'.¹⁷ The teaching of English was also important because Singapore had to play host to MNCs from North America, Europe and Japan. This meant that the workforce not only had to be well-disciplined but also sufficiently cosmopolitan in outlook, rather than entrenched in ethnic or cultural localism, to adapt to the different cultural proclivities of the MNCs moving into the country.

From the outset there was little sense of education for its own sake. It was an 'investment' that the future of Singapore was seen to depend. Ashton and Sung (1997) have argued that the relationship between education and economic development is historically specific. Singapore may indeed be the first advanced economy to approximate a 'direct correspondence' between education and production (Bowles and Gintis, 1976). The subordination of the educational system to the 'needs' of the economy was legitimated as necessary to 'catch up' with other developing and developed nations. It was seen to reflect the meritocratic principles on which Singapore was to be build. People were to be judged on their individual abilities and efforts regardless of social class or ethnicity. The normal curve of ability was taken for granted by the PAP political leadership, and as the above quotation from Lee Kuan Yew suggests, he believed in a 'cognitive elite' rather than the 'feudal dogma of social predestination' (Dewey, 1916) that supported the European aristocracy in the nineteenth century.

This led to the creation of a selective and highly competitive system of education, but one that has always been subordinated to the perceived needs of the economy. In the 1960s and 1970s, the main issue was how to raise the general standard of literacy and numeracy. Universal free primary education was not accomplished until the mid-1960s, reflected in the increase in the numbers of teachers from 10,590 in 1959 to 17,184 in 1965. Along with continued efforts to generate a socially disciplined cohesive society, greater emphasis was placed on the demand for technical education and training in recognition of the importance attached to the manufacturing sector. A National Industrial Council was established, comprising the Ministers for Education, Finance and Labour aimed at coordinating the growing demand for craft and technical skills. All boys and some of the girls were expected to study technical as well as academic subjects in the early years of Secondary education from 1969 onwards. The Singapore Technical Institute was also established and Ngee Ann College, later to become a polytechnic, was upgraded to undertake the training of industrial technicians (Yip et al. 1997: 11). In the 1970s the Industrial Training Board (ITB) assumed responsibility for industrial training from the Technical Education

Department, again as a way of integrating the activities of the educational system with the changing demands for jobs in manufacturing.

By the end of the 1970s it was not only the quality of technical education that required upgrading but the system as a whole as 'certain 'cracks' and weaknesses in the system became manifest. The Goh Report (1979) identified a number of problems: a wastage of talent as a result of a rigid curriculum and common examination system which favoured academic achievement; low literacy; ineffective bilingualism; a wide disparity in school performance, low teacher morale and inefficiencies in the Ministry of Education (Yip et al., 1997:15; Ashton et al., 1999). This report led to the introduction of academic streaming at both primary and secondary levels so that 'for a child who is not meant for academic endeavours, streaming would help to ensure that he acquires basic literacy and numeracy, as well as preparation in training for a skill' (Yip et al. 1997:17). It is worth noting here that assumptions about innate differences in ability were presented as a temporal issue; giving 'less capable' students the chance to develop 'at a pace slower than for the more capable' whilst also allowing 'a child every opportunity to go as far as he can'.¹⁸

At the secondary level three streams were created: the Special, the Express and the Normal. The Special route was offered to the top 10 per cent of students who were expected to be bilingual at first language level and sit the General Certificate of Education 'O' level after four years. The Express course taught to first language level in only one language and also sat 'O' levels after four years, whilst the Normal students sat a different 'N' level examination which reflected the less academic nature of their studies. There was also greater scope for these students to study vocational subjects of immediate relevance on entry to the labour market. The streaming of students was extended in 1984 with the introduction of the Gifted Education Programme (GEP) for the 'intellectually gifted' child although less than 1 per cent of students have attended these schools. Along with this system of streaming is the principle of 'progression' based on the idea that Singapore cannot waste the talents of its people and given that intellectual maturation may vary, it is important to ensure that students always have the opportunity to advance through to university.

This aspect of the New Education System (NES) outlined in the Goh Report was part of a broader strategy to upgrade the quality of the workforce. It is no coincidence that this Report was published at the same time that wages were increased to encourage employers to raise the skills and productivity of the work force. Yip et al. suggest that 'Where the reforms of the preceding two decades had been taken up largely with immediate needs - viz the survival and socioeconomic exigencies of this new, emergent nation - the reforms since 1979 have shown a certain degree of sophistication, characterised by a spirit of self-appraisal and a greater all-round balance in relation to the broader goals of education' (Yip et al. 1997: 23). But this should not obscure that fact that the economic imperatives of education were, if anything, becoming more important as skill levels were increasing. This priority was epitomised by the Council on Professional and Technical Education (CPTe)

established in 1979. The role of the CPTe is to set quotas for courses in universities and polytechnics which match the anticipated demands for different kinds of workers. As a senior advisor suggested this 'allocation principle' is necessary because of a shortage of labour as 'there are only 50000 babies a year'. And the priority is to ensure that there are enough technicians and engineers. The Ministry of Trade and Industry told us that at the secondary school level 'we don't care if you study literature, but you have to be good in mathematics and science'. Rationing of places is combined with keeping the costs of science and engineering courses comparable with arts and business studies. Students are given a preference for what they would like to study at university and polytechnic but this is strictly determined by school grades. 'Those who don't get their choice are allocated, especially to engineering'. These students 'are carefully monitored and given extra tuition'.

The concern about training enough engineers at the tertiary level is not only motivated by an inherent shortage which they try to overcome by attracting foreign technicians and engineers, but from a belief that an education for economic life is best achieved through the Sciences rather than the Arts. As we were told by the Ministry of Labour, 'we are more worried about people adopting the softer options rather than engineers going into business. Doing Law, Arts, etc...engineering degrees give you a lot of systematic analytical skills...an engineer is better than a business graduate at the first degree level. The engineer could go on to an MBA but the business graduate is not going to become an engineer'. Such sentiments are reflected in the proportions of university students studying engineering. In 1997 about 61 per cent of males and 28 per cent of females were studying Engineering.¹⁹

Efforts to ensure an adequate supply of technical workers was advanced in the 1980s through the establishment of the Vocational and Industrial Training Board (VITB) which combined the activities of the Adult Education Board and the Industry Training Board into a single national training authority for the provision of vocational and industrial training. This consistent effort to improve the status of technical education and apprenticeship training reflects the generic upgrading of skills within the workforce. Predictably, the VITB was later to be reincarnated as the Institute for Technical Education (ITE) in 1992. The ITE which runs a number of training centres represent state-of-the-art facilities both as a way of making training more relevant to the needs of an advanced economy and to dampen the demand for university and polytechnic education, as these offered the best route to the real vocational prizes.

To put these changes in context, 60 per cent of the workforce in 1979 had no secondary education, and only 3 per cent had been educated at the tertiary level (Yip et al. 1997: 24). This figure increased to approximately 27 per cent by 1994.²⁰ The low educational levels of the Singapore workforce reflects the rapid development of the country since the mid-1960s and the poor quality of education and training prior to the developments described in the 1970s. This has led to strenuous efforts to improve the skills of adult workers. The National Productivity Board (NPB) established in the early 1970s, which became the Productivity and Standards Board

(PSB) in 1996 under the Ministry of Trade and Industry, substantially increased its commitment to the training of adult workers following the introduction of the Skills Development Fund (SDF) in 1979. This tax on low-skilled work has been used to provide finance incentives to employers to train and upgrade the skills of their employees. In 1986 there was one training place for one in ten workers, whereas the figure in 1998 is one in every three (PSB, 1998).²¹

The PSB works closely with employers, trade unions and other government agencies to ensure the quality and relevance of in-employment training. The two interrelated strands of its strategy are to upgrade worker skills to meet industry requirements and to improve the utilisation of labour given that through improvements in productivity and the introduction of new technologies, '25 per cent of the workforce could be freed up to do more value added jobs' (PSB interview). Therefore, a raft of modular training schemes were launched in the 1980s for mature workers to improve their skills. These included Basic Education for Skill Training (BEST); Modular Skills Training (MOST); Worker Improvement through Secondary Education (WISE) and Core Skills for Effectiveness and Change (COSEC).

These programmes have been effective in rapidly reducing illiteracy and in lifting the skills base of the workforce. Likewise, the educational system had been transformed into one of the efficient factories for 'stamping out 'O' and 'A' level candidates' (academic interview) in the world (Green, 1999). Its success in Mathematics and Science has been subject of world acclaim. There has also been a significant increase in the numbers of students entering higher education.

Table Two: Graduates from Institutions of Higher Learning (number)

	1994	1999
Total	19,057	25,716
Polytechnics	10,287	14,641
National Institute of Education	1,256	1,612
University*	7,514	9,463

* National University of Singapore & Nanyang Technological University

Source: Statistics Singapore 2000 at <http://www.singstat.gov.sg/Fact/SIF/sif20.html>
Singapore Department of Statistics.

Indeed, much of the writing on Singapore has described these changes during the 1970s and 1980s as 'revolutionary'. The extent of this 'revolution' has been exaggerated, at least in the context of the changes that it now confronts. Until the early 1990s the model of the worker-citizen has remained largely unchanged. An increase in the technical knowledge required to fulfil occupational tasks is not inconsistent with the principles of the learning model based on a standardised division of labour. The emphasis has been on following instructions and management decisions resting on a set of rule, roles and procedures that rewarded reliable performance.

A knowledge-driven economy depends on a different kind of worker from that required for the mass production of standardised goods and services. This has far reaching consequences for the occupational structure and skill formation strategy that has served Singapore well in the last thirty years. It is not simply a question of a linear progression with an increased number of employees requiring technical and graduate level education and training. The change is both quantitative and qualitative. The workforce must be willing to update their skills on a regular basis and to become lifelong learners.²² But there is equally a need to have a workforce that is more creative, proactive, and which has people with good problem-solving skills. As David Lim Tik En, Singapore's Minister of Defence has noted that 'In a global economy, we can stay competitive if we accumulate knowledge and use it to innovate. We have done well for the first part - accumulating knowledge. Our past emphasis on education and skills upgrading has given us a head start. But the second part requires a different ethos. Being innovative is not the same as being productive. It requires that we go beyond applying set rules and proven formulae. We have to invent new ideas from our existing pool of knowledge. We have to think outside the box' (1998:62).

This aspiration to 'think outside the box' raises the question of how to move from a 'learning' society in Amsden's terms to one based on innovation. This is captured in the idea of the 'technopreneur' which involves workers in established as well as newly created businesses being able to find new ways of improving productivity or product design. There is, after all, a big difference between entrepreneurial activity around 'micro chips' as opposed to 'potato chips' (Thurow, 1993; Lauder, 1999). The technopreneur is someone with high level technical skills whom within a company is 'able to move their ideas, challenge existing thinking and then keep moving, introduce new processes, new organisation structures and so on' (NSTB interview).

A major challenge in Singapore is to change the mindset of the workforce because the existing momentum and role models that they see encourage them to join the government or a large companies as 'the environment is so safe and the opportunities so good' (NSTB interview). But a major element of skill formation in a knowledge-driven economy is the development of indigenous companies, from which they take inspiration from Switzerland and Sweden. 'You will change the mind set by telling them that this is the next Mount Everest to climb. This is the next challenge, that we have already climbed this hill; working for a multinational, working for a government - too common...So we will want to have our engineering and science students to understand that science and technology is no longer just the creation of products, processes, services, but we should add one more thing, companies, the creation of companies' (NSTB interview).

This change in mindset is central to the new model of the worker-citizen in a broader sense. There is a recognition that it is impossible to create a more innovative workforce based on a system of rote learning and close supervision. Regulation

increasingly has to be 'self-imposed' as a part of 'responsible' rather than 'disciplined' activity. It is not by chance that the notion of 'emotional intelligence' (Goleman, 1996) has been officially sanctioned with the publication of a series of books on various aspects of emotional intelligence at work and in everyday life, which can be purchased from the Government Bookshop. More of the in-employment programmes run by the PSB such as People Developer, aims at improving the quality of human resource management and training in companies, and the CREST programme which stands for Critical Enabling Skills Training is an attempt to develop the non-technical skills which in the case of CREST is a national training initiative that seeks to create a workforce able 'to continuously adapt to change, learn new skills and meet the challenges of the knowledge age' (PSB, 1998).

Reforms in the education system also centre on developing problem-solving, self-management and interpersonal skills. 'As people are our only resource, we must develop the potential of our students to the fullest. Our curriculum must be responsive to current and future needs of our nation. Our students must be creative problem-solvers, constantly seeking ways to improve what they do and with a lifelong quest for learning' (MOE, 1998: 30). This has led to the introduction of The Thinking Schools Initiative, aimed at 13 and 14 year olds in the Express and Normal Academic streams. It is not intended for less academic students found in the Normal Technical stream, although some of these students are following this programme.

There is also a policy to reduce curriculum content by 30 per cent to allow for more project work and teamwork in order to develop a broader range of skills (Gopinathan, 1999). Change in university entry requirements are also being introduced to reflect the shift away from rote learning and producing a nation of 'great copiers' in a system 'drowning in information, gasping for knowledge'.²³ It is proposed that by 2002 A-level grades will account for 75 per cent of the entry criteria to university, with the introduction of the American Scholastic Assessment Test (SAT) (to be modified for Singapore students) accounting for the remaining 25 per cent. There is also the possibility of bonus points being awarded for extra-curricula activities, although the exact basis on which such awards are to be made remains unclear. By 2004 A-level grades are set to decline to 65 per cent of the entry criteria as 10 per cent will be awarded for project work.²⁴

Alongside these initiatives the Ministry of Education has introduced a programme of National Education, 'Our education system should not be judged solely by the number of A's our students get in major national examinations, nor by the high standing of our students in international comparisons of science and mathematics achievements. Equally important is the quality of the people the education system produces - their integrity and character; their attitude towards work, their ability to be team-players, and their sense of responsibility and commitment to society' (MOE, 1998: 58). The need to inculcate a sense of what it means to be Singaporean reflects the increasing problem of finding a new balance between greater personal freedom in what people think and do, with a concern to maintain social discipline and cohesion. Therefore, it

is to the 'pressure points' (Brown, 1999) that will shape the future of skill formation in Singapore we now turn.

Section Two: Possibilities and Challenges

Globalisation and the Role of the Developmental State

If some of the leading pundits of globalisation were to be believed (Ohmae, 1996) it is not only the 'developmental model' but the nation state which is in crisis. However, our analysis suggests that such accounts are misleading (Brown and Lauder, 2000).²⁵ One problem is that commentators in the West continue to have considerable problem breaking free of the mentality of the Cold War - the free market versus the command economy. One of the consequences has been, as noted earlier, a failure to understand the skill formation strategies of Japan and the Tiger Economies (World Bank 1993; Wade, 1990). Rather than undermine the role of the state in Singapore, globalisation has ensured the viability of the PAP. If this had been left to the market, companies may well have invested in Singapore in the 1970s and 1980s but there would have been little incentive to lift skill levels or spread prosperity throughout the population. In the current context, as its regional neighbours and China (with a population of over 1.2 billion) actively compete for inward investment, Singapore would find itself having to reduce wages and costs in order to attract new investment or to retain the MNCs already located in Singapore.

There is no evidence that Singapore is about to abandon its developmental strategy based on 'governing the market' (Wade, 1990), as a result of more intense global competition. It continues to be extremely successful in developing strategic employment clusters through the work of the EDB. It has defined these clusters in broad enough terms to avoid the problem of being dependent on one or two industrial sectors that would make a small economy like Singapore vulnerable to global volatility, such as when the market price of memory chips took a precipitous drop in the 1990s. The idea of 'governing the market' offers a useful point of comparison with countries such as Britain and the United States that highlight the virtues of being 'governed by the market' (Brown, 1999). Manifestly the PAP in Singapore does not full control its domestic economy, let alone impact on the global economy, given its heavy dependence on 'foreign' MNCs. It must constantly address the enlightened self-interest of companies with reference to new market opportunities in Singapore or elsewhere in the region. This is relatively easier to achieve when companies can see the benefits of production or service delivery close to the market place, but the same logic does not apply so really in the case of research, design and development, where proximity to regional markets is less compelling. The MNCs are reluctant to diffuse state of the art technologies for the purposes of domestic skill development. Much of the research and development undertaken by the MNCs remains close to the 'home' base. Singapore has the added problem of a weak research infrastructure (Hang Chang Chieh, 1998). But unless it can develop its R&D capability it will become more vulnerable to regional competitors such as Malaysia who are

continuing to up-grade their skills base into technical areas with lower wage costs. Singapore now confronts the problem of losing its competitive advantage in terms of skill when neighbouring countries can offer the same skilled workers at a lower price, as South-East Asian countries seek to move up the value chain. Singapore is already finding it difficult to maintain a quarter of the workforce in manufacturing employment, due to price competition. This as we have seen has led to a greater emphasis on exportable services such as education, health, media and the arts (see Table Two).

Table Three: Change in Industrial Composition and Average Earnings by Sector

Sector	1987	1997	1987	1997	% change
			Monthly Average Earnings (real) S\$		Annual
Average					
Manufacturing	26.7	22.6	1168	2282	7.7
Commerce	23.4	21.8	1131	1916	8.0
Transport and Communication	10.2	11.5	1510	2368	8.0
Financial and Business Services	8.9	14.9	1810	2756	8.7
Community and Personal Services	21.5	21.3	1620	2363	8.2
Others	9.3	7.9	na	na	

Source: Report on the Labour Force Survey of Singapore 1997, Research and Statistics Department, Ministry of Labour 1998 p.ix. Average Monthly Earnings derived from Table 2.2 p.18 1997 Singapore Yearbook of Manpower Statistics, Manpower Research and Statistics Department, Ministry of Manpower, 1998. Figures of percentage change in total wage increase based on table 2.8 p.72 Singapore Yearbook of Manpower Statistics, Manpower Research and Statistics Department, Ministry of Manpower, 1998.

In the West it is common to hear politicians and business leader state that corporate ownership is unimportant, because what really matters is the quality of jobs that companies bring to the domestic economy. In some respects Singapore testifies to the validity of such claims, but it also demonstrates the vulnerability of becoming too dependent on jobs provided by 'foreign' companies. We have described Singapore's response as a one nation, dual economy, based on a *vital* state within Singapore and a *virtual* state in the region. The extension of the 'external wing' is part of a strategy to develop its own indigenous business by facilitating their expansion into international markets. This is part of a longstanding problem of Singapore's reliance on MNCs who are located in the City-State for instrumental rather than affective reasons. The attempt to develop its own World-Class Companies is an attempt to 'lock in' high value activities and jobs, which would also make Singapore less vulnerable to the whims of foreign MNCs. It is also based on a recognition that if it is going to succeed in developing indigenous capability in R&D and business hub activities it will need to achieve a rapid expansion of Singaporean companies.

Low (1998:177) has noted that the government has primarily had to deal with non-Singaporean business leaders and there are 'strict conditions laid down for non-interference with domestic politics which suit MNCs which have no preoccupations

other than the bottom line'. But if the government is successful in developing a critical mass of medium and large companies the voice of business may become more powerful. However it should always be remembers that most things in Singapore happen 'by design' and the state has taken an active involvement in developing companies which will continue to maintain close contacts to government, ensuring that business leaders are fully involved in the consensus building process.

However, the biggest threat to the future of skill formation in Singapore stem from inherent tensions within its developmental strategy as a whole. The nature of these problems will become clear in the following analysis, but they stem from attempts to transform Singapore from a 'paradigm of late industrialization through learning' (Amsden, 1989: 4), based on borrowed technologies, technical training, rule following and worker discipline to a paradigm of a knowledge-driven economy with its emphasis on innovation, research, technopreneurialism and self-management.

Upgrading the Skills of the Workforce.

A major strength of skill formation in Singapore has been its ability to coordinate the supply and demand for workers within a virtuous circle of skills upgrading. Ashton and Sung argue that this correspondence between education, training and economic growth holds the key to understanding Singapore's economic competitiveness. But as high value added employment comes to depend on a different kind of worker from that required for the mass production of standardised goods and services, Singapore's skill formation strategy now confronts new challenges. To date, education, training and employment opportunities have been tightly coordinated by the state allocating education and training places to meet the perceived needs of employers in each of the major industrial clusters that form part of the countries competitive strategy.

Flexibility within the labour market has been achieved through a system of 'guest workers' to undertake the jobs that Singaporeans do not want to do and a 'foreign talent scheme' to attract high skilled workers to undertake profession, managerial or technical jobs which can not be filled by Singaporeans or in fields where there is little indigenous expertise. Approximately 25 percent of the workforce fall into these categories although the majority are low skilled workers attracted by high wages relative to wage rates in their home countries.

There is little training provided for these low-skilled workers, who are expected to 'return home' after two years. This significant reserve army of labour has given Singapore a healthy buffer in periods of unemployment. If there is economic downturn these workers could be repatriated early which has allowed the state to maintain its commitment to full employment for the indigenous workforce. However, in the late 1990s unemployment in Singapore rose to 7 per cent. This was due to geo-politics problems where the government found it difficult to exploit the labour market flexibility

which derives from its foreign worker policy. Given its geo-political vulnerability it was decided to defer repatriation of low skilled guest workers in an attempt to stabilise political relations with neighbouring countries that have been hard-hit by the 1997 financial crisis.

The problem of finding employment for low-skilled Singaporeans has also become more acute with the rapid shift from low to high value business, associated with rising labour costs. Along with other developed economies it confronts the problem of a lack of low-skilled, but moderately waged jobs, previously found in manufacturing. Many of these low skilled Singaporeans are over forty and have no secondary education. There are currently 41 percent of those aged over forty with no secondary education and this will remain at 36 percent in 2010. At the same time the numbers of workers over forty will increase by 28 percent during the same period (Pious, 1998). These workers represent around a quarter of Singapore's workforce.

This problem reflects the growing problem of 'structural' unemployment and economic polarisation (see below) in Singapore. As the economy restructures the skills of these older workers will be inadequate to meet the requirements of new employment opportunities. Lim Swee Say anticipates a problem of 'structural under-employment', where workers retrenched from the consumer electronics sector are not moving into new growth sectors such as wafer fabrication, 'We do face a real threat of structural unemployment in Singapore because of the large number of unskilled workers in our workforce and the fast pace of economic restructuring' (1998:41). The problem involved in upgrading the skills of these workers has been long standing, which the Productivity and Standards Board (PSB) has been energetically attempting to alleviate. The difficulty is that the standard of basic education is low and has meant that most programmes initiated by the PSB for older workers have been rudimentary. The numbers involved in training programmes continues to be impressive but it has not resolved the problem of older low-skilled workers.

However, the response to worker retrenchments at the end of the 1990s reflects the strength of Singapore's approach to 'joined-up' government. It is recognised that unemployment is always a politically sensitive issue that conflicts with the aspirations of the trade union movement. In response the National Trade Union Congress (NTUC) was given responsibility for delivering the Skills Redevelopment Programme. The aim of the Redevelopment Programme is to identify workers whose jobs are being restructured or retrenched to follow a training course before these changes occur in order to prepare them to fulfil their new job tasks or to improve their chances of finding another job. The key sectors where training is to be undertaken is decided by the NTUC in conjunction with the appropriate government departments such as the EDB, rather than by the companies who are not seen to have the same time perspective or understanding of the economy as a whole. Indeed the aim is to match retrenched workers on these programmes with new job opportunities in other companies. The incentive for companies is that they receive a subsidy of 70 per cent of training costs.

There is also a realisation that although it has been successful in getting the MNCs to upgrade the skills of workers, it will not be able to prevent the restructuring of companies as the MNCs pursue policies of global integration. Therefore, there is an acknowledgement that company restructuring along the lines of Anglo-Saxon capitalism is taking place in Singapore. This will lead to a widespread change in the employment contract for many Singaporeans. MNCs, especially from the US, are likely to adopt the same model of organisational restructuring that they operate in their home market. This will mean fewer 'core' jobs and a greater use of outside contractors to deliver non-essential activities. This will lead to a reduction in job security and the need for employees to maintain their 'employability' in both inside the company and in the external job market (Brown, 1994). The problem this poses for Singapore's skill formation strategy is that the labour market will become more fluid and volatile. It may also make it more difficult to predict the skill demands in specific areas of economic activity.

These problems of regulation are related to the way the state, through the offices of the CPVE, channels students through the education and training system. The rationale for the tight restrictions on entry into university is that it is a small country of around 3 million people, therefore it must ensure a tight fit between the education and labour market opportunities. As we were informed, 'one graduate unemployed is one graduate too many'.²⁶ Until recently it has targeted intermediate vocational skills as the key to Singapore's prosperity and has adopted various means to enhance the image of the polytechnics, which take students from the age of 16 for studies at a sub-degree level. These polytechnics are equipped with state-of-the-art technologies to ensure both high quality training and to symbolise the status attached to technological education. The investment in state-of-the-art equipment is equally true for the Institute for Technical Education (ITE), geared towards technical training for those with modest academic records.

The Ministry of Trade and Industry imposes a workforce planning model to determine how many places are to be available for each programme in what institution (i.e. university, polytechnic or ITE). Such an approach is unpopular with many middle class parents who are unable to get their children into Singapore's two universities. The response has been to send students to study at universities in North America, Europe and the Antipodes (approx 10,000 at any one time). Whether it is possible to regulate the educational and occupational aspirations of the middle classes in the future is a moot point. It will continue to depend on whether the economy can generate decent jobs that offer career prospects for polytechnic students. But what is perceived as a 'good' job to parents living in a society that has experienced rapid economic development compared to their children is different. University is seen to be a rite of passage for middle class youth into managerial and professional occupations. These pressures may be alleviated to some extent by the need to develop Singapore's research and development (R&D) capability. If this is to become more than a token gesture in a knowledge economy it will involve the polytechnics as well as the universities being

involved in research and design activities. This may lead to polytechnics being given university status, able to award undergraduate and postgraduate qualifications. Issues of how the Singapore government attempt to develop and regulate the social and economic aspirations of the young as part of its overarching skill formation is also closely linked to the changing model of the worker-citizen. But before examining that issue we need to consider the challenges presented by distributional issues of 'who gets what'? This, in turn, is related to the level of social trust required for a nation to become a knowledge-driven economy.

Social Cohesion, Opportunity and Skill Formation

It is often argued that an important feature of the economic development of Japan and the Asian Tigers is a high level of social cohesion or trust, reflected in smaller income differentials than those found in the United States and Britain. High levels of social trust are seen to be beneficial to skill development as individuals and families feel a strong sense of personal and collective responsibility to achieve at school and upgrade skills when required. Therefore, issues of skill are closely related to those of rewards, status and social justice: to questions of who gets what? This 'skills nexus' between economic efficiency and social justice has been central to Singapore's developmental strategy. It has successfully linked both the legitimating strategies of nation states identified by Castells, namely Singapore as a 'societal project', aimed at building a viable city-state against the odds, and legitimation based on 'society-as-it-is' (delivering prosperity, democracy, quality of life). Indeed, Castells (1996) warns against western ethnocentrism by assuming that legitimation can be measured by the level of democratic participation in society.

Singapore, however, has a pattern of income inequalities more akin to the United States rather than Japan. The problem in Singapore is that little attempt has been made to restrict the pay of 'symbolic analysts' working for MNCs (Reich, 1991). Equally, the government has been committed to equality of opportunity not equality. This commitment to rewarding male talent is reflected in the incomes of Government officials. Figures compiled by the World Competitiveness Report, 1996 show that the Political Chief Executive in Singapore is compensated to the tune of US\$812,858, this is over twice the amount paid in the US, Japan, Germany, and the UK. Cabinet Ministers in Singapore received US\$574,476; Legislators US\$65,174, and Senior Civil Servants US\$292,714, these figures compare with an average salary of US\$14,459 for manufacturing employees. On the World Competitiveness Report's Altruism Index, which is the salary of the political chief executive divided by that of manufacturing employees, the ratio is 56.2 for Singapore, 6.2 in the US, 8.2 in Japan, 8.4 in Germany and 5.3 in the UK (Low, 1998:214). The scale of these income differentials reflects a broader pattern of income inequalities. The distribution of household income of the bottom 20 per cent when compared as a ratio of that received by the top 20 per cent reveals Singapore to be even more unequal than the

United States of America. The ratio for Singapore is 13.7, 13.2 in the US, and 8.3 in Britain. The comparable ratios for Japan is 2.7 and 5.3 in Taiwan.²⁷

However, the Singapore government has been able to maintain a high degree of social cohesion because it has succeeded in 'raising all the boats'. Full employment has enabled virtually everyone to have a job if they entered the labour market. Through a process of skills upgrading and productivity improvements significant wage increases have been achieved across all the major industrial sectors. These have averaged around 8 per cent, per annum. Coupled with significant increases in house prices spread throughout the population, it is not surprising that the scale of inequalities in Singapore have yet to have a serious impact on the social capacity for learning, innovation and productivity.

Equally, although there is a relatively low rate of personal tax in Singapore (28 per cent) and the absence of a western style welfare state, there is a significant redistribution of income based on the Asian proverb 'it is better to teach them to fish than to give them fish' (Government of Singapore, 1991:118). This has been used to legitimate major investment in housing, health care and education based on co-payment to maintain a sense of contribution rather than simply one of 'rights' to services.²⁸ A heavily subsidised system of public housing is, for instance, offering everyone the opportunity of owning their own home (84% in the early 1990s), with government funded up-grades of older housing estates. The welfare of the population is also maintained through a social security net in the form of the Central Provident Fund (CPF) which is compulsory for both employees and employers to contribute approximately 20 per cent each of waged income (as a response to the Asian financial crisis employers contribution were reduced by 10 per cent).²⁹

CPF provides for a pension in old age, major illness, incapacity or premature death of a breadwinner, it can also be used to help towards buying a home and for educational purposes. Those on low incomes receive top-up payments into their CPF for instance in the form of Edusave, which is a scheme to help children from low income families meet the costs of school fees from the age of 6 to 16 years. There is also a Student Welfare Fund to help needy children. For those who are not covered by the CPF there is Public Assistance (PA), which is 'provided to help the financially distressed regain their independence. It is not intended as an unemployment, retirement or disability support. The numbers receiving this form of assistance was less than one per cent of the population (1,960 in 1997), which represents a reduction from 2,934 in 1987.³⁰

Chua Beng Huat suggests that 'for the first 25 years of rapid economic growth, the rate of upward mobility has been very rapid across the entire population. This was largely because of the relatively homogeneously 'poor' - not only in wealth but also in education attainment' (1999; p.216). But a class structuring has been developing in Singapore despite efforts by the PAP to use social and economic policies as a way of correcting some of the fragmentary consequences of market capitalism. This he

suggests has become more conspicuous with the rise in consumer spending, especially in terms of housing and cars, 'the intensification of inequalities have been submerged under two conceptual frames of organizing the Singapore society, namely, the idea of 'meritocracy' and the idea of ethnicity or race' (pp.215-6).

The vision of Singapore as a multiracial society is sacrosanct. The official view is that all ethnic groups have rich, comfortable and poor, as each group is vertically integrated as a social unity through a shared 'traditional' culture (Chua, 1999: 217). This is given institutional expression in the 'community self-help' organisations where the wealthy are expected to contribute to the welfare of the needy within one's own racial group. Chua notes that 'each racial group has been encouraged to look at their economic position at any one point in time with reference to their own past rather than to compare themselves across the racial divisions' (p.217). His conclusion is that the government has largely succeeded, as 'it had become clear that racial background was no longer an important criterion for determining poverty' (1999:217). Nevertheless, the General Household Survey of 1995 continued to reveal ethnic differences in the monthly income of workers. The lowest income category included those with incomes below S\$500 per month, this accounted for 4%, 7.2% and 12% for Chinese, Indian and Malays respectively. The comparable figures for the highest earner category (those receiving S\$3000 or over) were 23.1%, 19.1% and 6.4%.³¹ However, the main ethnic tensions that are likely to arise in Singapore stem from the spill-over from ethnic conflicts in Indonesia.

The impact of socio-economic inequalities on Singapore's commitment to meritocratic competition does present a major challenge to its skill formation strategy. The ideology of meritocracy is deeply ingrained in Singapore as it tries to keep alive the Singaporean Dream of social improvement for oneself, one's family and the society as a whole. When meritocracy is able to operate in a context of economic growth and full employment it can be seen as both a neutral way of judging contestants and to lead to greater equality of outcome, in the sense that more middle class jobs are created. The problem at the end of the century is that meritocratic competition operates in a different labour market context. There is more inequality between occupational positions, along with problems of unemployment or underemployment, which greatly exaggerate the consequences of success or failure in the competition for credentials. The more the stakes are seen to increase the more intensive 'positional' competition between individuals, families and social classes will become (Hirsch, 1977; Brown, forthcoming). There is a real danger of growing rigidity in Singapore's class structure unless it can find ways of limited the competitive advantage of middle class families in the competitions for certificates and jobs.

As the Deputy Prime Minister, Lee Hsien Loong has noted that whilst 'meritocracy underpins the entire Singapore system...equal opportunities generate unequal outcomes. As our society matures, in the absence of periodic shake-ups, these inequalities will become more marked...We must manage these natural differences properly, and not let them be reinforced by social distinctions and barriers. Otherwise,

we will accentuate the natural fault lines in our society and generate powerful divergent pulls' (1998:5). But there are signs that despite the successful performance of Singapore schools in international attainment tests, class rigidities may develop. One of the problems is that the tight controls on access to university leads to intensive competition for university places which will make it especially difficult for students from disadvantaged backgrounds to demonstrate their 'talents' relative to fellow competitors.

This elitism is endemic within the administrative class. Even the Deputy Secretary-General of the NTUC, Lim Swee Say who is often insightful about the political economy of Singapore fails to understand the consequences of even greater diversification in Singapore schools. He suggests that in an information economy 'Social intelligence will become more important in preparing young Singaporeans for the fast-changing world of the future. Even though our education system is one of the best in the world...academic performance is not everything. Interpersonal skills and thinking skills are equally, if not more, important in the future world...the emphasis should shift from Intelligence Quotient to what has been referred to as the Emotion Quotient. The Government has set up independent schools to adopt new and innovative teaching methods. It has also identified the nurturing of an innovative mindset as a new thrust in our education system. It may be timely now for us to go one step further to review and expand the roles of private schools, which now admit only foreign students, and allow them to compete for Singaporean students' (Schein, 1996:174). The consequence would be a marketisation of education, where the ability to pay would accentuate socio-economic inequalities.

Such issues are important because the success of economic nationalism since the 1960s has been a vital source of social cohesion. Singaporeans have put their trust in the PAP because it has delivered the 'goods'. However, more conspicuous educational, social and economic inequalities may make it harder to convince all sections of society to maintain their social discipline. But this is to pose an intriguing question for comparative analysis, because the relationship between social cohesion and economic competitiveness is historically variable. What is required in conditions of Fordism may be different from that required in the knowledge-driven economy Singapore is now trying to create. In conditions of Fordism, social cohesion becomes a source of productivity gain when it can contribute to a workforce that is committed, disciplined, hardworking, and able to accurately learn and copy routine ways of doing things. However, if people are expected to be creative problem-solvers; self-managers; enterprising, and lifelong learners, it involves more than a change in mindset. It involves institutionalised relations of trust (Fox, 1974; Baron, et al., 2000), which assume a high degree of individual discretion and freedom that have been largely absent in Singapore. Therefore, the question is to what extent will Singapore require a wholesale change in its social and political institutions to generate the kinds of workers it now believes to be essential to economic competitiveness? This takes us to the challenges it now confronts in its attempt to transform the model of the worker-citizen.

Engineering the 'New' Worker-Citizen for a Knowledge-Driven Economy

We have described how the Singapore government has recognised that to become a knowledge-driven economy it is no longer sufficient to maintain a 'learning' model (Amsden, 1989). Economic competitiveness is now seen to depend on a different kind of worker from that required for the mass production of standardised goods and services. As in Western economies a greater emphasis is placed on individual creativity, pro-activity, self-management and problem-solving skills. This is captured in the idea of the technopreneur where workers in established, as well as in nascent businesses, are able to find new ways of improving productivity, design, products or services to compete in the global market.

Debates about the changing model of the worker-citizen in Singapore also centre on the impact of global communications and the growth of E-commerce. There was little prospect of Singapore becoming a business hub unless it had sophisticated communication networks. When *A Vision of an Intelligent Island: IT2000 Report* was published in 1992 the full commercial potential of E-commerce (doing business through the internet) was not fully recognised. The government was hopeful of creating an Intranet that could be used to regulate access to the Internet. Control of the media ensured that opposition voices against the PAP government were muted, but the Internet has proved to be impossible to regulate despite attempts to keep some of the 'highways clean' (Chye & Mahizhnan, 1998). Singaporeans now have access to views about their political leaders, country and lifestyles that may directly contradict the views of the PAP. The concern is that this will fuel demands for greater personal freedom that could undermine the social discipline and work ethic on which the 'survival' of Singapore is still seen to depend. At the same time, large numbers of Singaporeans are leaving to study, work and play in other countries. This exposure to alternative social, moral and cultural standards further limits the scope of the government to regulate the ideas and behaviour of the people. The introduction of National Education represents an attempt to bolster nation building, along with the establishment of the Singapore International Foundation to facilitate contact with and between Singaporeans living abroad, including building primary schools for expatriates, satellite television and a world service radio station (Rodan, 1996).

Hence whereas nation building and economic modernisation operated in tandem they are now in creative tension if not conflict. Globalisation and the creation of Singapore as a communications hub has made it more difficult to regulate the behaviour of the population as they travel the globe by plane or via the internet. The metaphor of the 'hotel' society captures this, as the issue of what it means to be Singaporean assumes greater significance at the same time that economic change suggests a need for personal empowerment and 'democratic' participation.

This has led to a paradox at the heart of Singapore's skill formation strategy. Its previous success has been founded on the quality of its administration, especially in the economic sphere. Lee Kuan Yew recognised the importance of having outstanding people in the civil service. As we were told by a senior government advisor the people who run the system have to be more intelligent than those they are regulating, 'we need to be smarter than the smartest captains of industry'. EDB staff energetically circumnavigated the globe in search of the best ideas, latest technologies, foreign talent to help Singapore become one of the most successful economies in the world. The administration is conversant with the latest business and economic ideas as management gurus from around the world go to Singapore to share their deliberations about the future. This has created a culture in which Singaporeans are expected to follow rather than lead in these new innovations. There is constant talk about changing the mindset of ordinary Singaporeans to show greater initiative, but there is little recognition that this will only succeed if there is a fundamental power shift from the top.

The attempt to transform the way people are to be socialised and disciplined for a knowledge-driven economy, collides with the view that 'if economic development is the ultimate goal, discipline and conformity cannot be dismissed too lightly over the preference for individualism and freedom' (Low, 1998: 27). But if the Singapore government is serious about developing an entrepreneurial rather than an employment culture it will need to find a new balance between the role of the elite civil service and the ideas, views and aspirations of the population as a whole. This in turn not only raises questions of political leadership or of institution building, but also questions of culture. To what extent do 'Asian' cultural values impede the development of the creative empowerment of the individual?

These tensions are reflected in recent changes to key aspects of the school curriculum. The Thinking Schools initiative (MOE, 1998), is intended to reduce the extent of rote learning by giving students space in the school day to reflect on what they are learning (Gopinathan, 1998). Unsurprisingly, the extent of these changes have to date been limited, after all the educational achievement of students in Singapore are as good as anywhere in the world when measured in terms of standardised tests for maths and science. Many teachers are reluctant to move away from tried and tested teaching methods which leave little room for ambiguity in the authority relations between teachers and taught.

The Thinking Schools programme aims to give students an average of one 35 minute session per week, although the idea is to infuse creative thinking through the education system. The introduction of the 'Thinking' programme in this format reflects the difficulty of introducing it into an educational system where there is an awareness that in other respects it is seen as very successful. Given that children at a young age have a natural curiosity that leads them to ask questions conducive to the development of creativity, it is surprising that the Thinking programme has not been introduced at the primary level. The reason is that it is best suited to those children in

the older primary years but this is a crucial time when students are streamed for secondary education. Equally, at the secondary level once students move into the third year of secondary education they begin to prepare for their 'O' levels. Interference with the streaming and examination process is something that the Ministry of Education is reluctant to initiate.

Equally, one of the obvious ways of reflecting the importance of project work and problem solving skills is to change the content of A level examinations. There seems little desire to undertake this task, although there are those who view it as a logic extension of education in a knowledge-driven economy. There are also no plans to limit the number of A-levels students can take, which means that the students will continue to extend their academic studies to win an advantage in a highly competitive market for university education. If the desire is to allow more time for project work and reward 'thinking' skills rather than rote learning, limiting the number of A levels students can study is an obvious policy option.

There are also important differences in the way concepts such as empowerment, critical thinking and creativity are understood in Singapore compared to Europe or North America. The Western definition of creativity is to be inventive and imaginative; to be able to create. In the West this has become an art form where we can now study the creative arts. In schools, art is taught as a means to self-expression and imagination. But in Singapore, Art was not included as one of the core subjects included in the 'thinking' schools curriculum, these were History, Geography, Maths, Science and English. They are operating with a technicist framework of 'creativity' which involves teaching a methodology based on what can best be described as rational problem-solving. The emphasis is on how to collect, marshal and interpret information in the development of a habit of mind which brings together critical thinking (which means questioning), creative thinking (which means thinking about a problem in different ways) and self-regulation (which means working towards the greater good of the family, company and the nation). This understanding of based on Edward de Bono's *Lateral Thinking* rather than John Dewey's broader notion of reflective thought (Dewey, 1916).

Dewey is interesting here because he neatly captured the problem that now confronts Singapore. For the last thirty years it is not only the nature of work which has encouraged the development of expert followers, but also the organisation of a skill formation system based on the development of a elite civil service of the 'brightest and the best'. This clearly conforms to Lee Kuan Yew's that 'Singapore is a meritocracy...men have risen to the top by their own merits, hard work, and high performance. Together they are a closely knit and coordinated hard core. If all 300 were to crash in one jumbo jet, then Singapore will disintegrate. That shows how small the base is for our leadership in politics, economics, and security. We have to, and we will, enlarge this base.'³² They could now probably fill two jumbo jets as they continue to operate with a very tight network of core personnel. But the down side of this approach is that it harbours a 'dim view of ability' among the general population

(Brown and Lauder, 2001). The restricted access to university education in Singapore not only reflects the perceived demands of the labour market, but the limited intellectual capacities of large numbers of Singaporeans. This is also reflected in its foreign talent programmes. It may be this view of intelligence which is most dramatically in need of changing (Gopinathan, 1999). As we were told by a senior advisor in a key government department, creativity and innovation is for 10 per cent of the workforce, 'it has to be like this. We should not be fooled by our own rhetoric. It's a reality of life that people have different potentials' so ultimately there is little point 'squeezing water out of rock'.

Such ideas are deeply ingrained in Singapore's education, social and economic institutions. In the document *Learning to Think, Thinking to Learn* (MOE, 1998) the Ministry of Education outlines its ideas on the thinking schools programme to create the new model worker/citizens of the future. But what underpins this is a close adherence to the 'three kinds of mind, three kinds of work' model inherited from industrial Fordism in the early twentieth century. This document notes the role of the Institute of Technical Education (ITE) is geared towards those at the bottom end of the cognitive order 'to ensure that its graduates have the technical knowledge and skills that are relevant to industry. As our industries move up the skill ladder, they will need highly skilled workers at all levels. ITE graduates will help to make the difference in sustaining Singapore's international competitiveness' (MOE, 1998: 51). The polytechnics students enter at the age of sixteen for studies below graduate level, are clearly targeted at the technically minded, 'Polytechnic graduates are valued as practice-oriented and knowledgeable middle level professions, much sought after by industry. Polytechnic graduates enter the workforce at line and supervisory levels and after 10 to 15 years, many move on to fill the middle and upper management layers in all sectors of the industries' (MOE, 1998:51). The universities are geared towards the cognitive elite in all sectors of industry, 'Our universities will strive to become world-class universities. They will provide a rounded yet vigorous education to potential leaders who will contribute to Singapore' (MOE, 1998: 51).

Due to its ability to deliver prosperity an unintended consequence of the government elite being left to govern is that it has encouraged the kind of 'trained incapacity' that the political leadership now recognised to be challenged for economic reasons. Dewey writes that 'In an autocratically managed society, it is often a conscious object to prevent the development of freedom and responsibility; a few do the planning and ordering, the others follow directions and are deliberately confined to narrow and prescribed channels of endeavour. However much such a scheme may inure to the prestige and profit of a class, it is evident that it limits the development of the subject class; hardens and confines the opportunities for learning through experience of the master class, and in both ways hampers the life of the society as a whole' (1916:363). Hence a key comparative question is the relationship between high skills and democracy as they appear to be more closely related in knowledge based economies, but this need not necessary imply a western model, individuation need

not be the same thing as market individualism (Durkheim, 1933; Brown and Lauder 2001)

Conclusion

What has been achieved in Singapore is little short of remarkable. Its approach to skill formation has lessons for both developed and developing economies, such as the importance of having a high quality, efficiency civil service; its approach to joined-up government; its economic foresight planning through the auspices of the EDB; and the quality of its technical education and training.

A further strength of its skill formation strategy is its location at the heart of Singapore as a 'societal' project. And any fundamental shift in this project would have profound implications for the future of Singapore. It has enabled all the boats to rise despite significant inequalities between socio-economic groups. The upgrading of skills has been successfully linked to housing, health, education, environmental and welfare policies. However, it may become more difficult to keep older, poorer educated workers from capsizing given that companies are reluctant to pay relatively high wages to low skilled workers when these jobs can be done more cheaply in neighbouring countries. Alternative low skilled service sector employment tends to be poorly remunerated and many of these workers who have experienced rising living standards for many years will feel that these jobs are beneath them. The demographic problem of an ageing population would appear to aggravate this situation. However, the one nation, dual economy strategy is likely to generate financial resources that will be required to support older workers and the elderly through a system of social welfare.

How far Singapore moves towards a more open 'democracy' clearly has implications for the organisation of skill formation. It is unclear whether its developmental approach, involving tightly integrated government departments and the meshing together of the supply and demand for labour, could be maintained when individuals have greater scope for personal initiative. There will be no democratic 'big bang' in Singapore, but there are at least attempts being made to test the 'democratic' waters in response to the demands of e-commerce and the Internet; changing skill sets; and growing calls from the middle classes to assume greater control over their lives at least in the area of cultural consumption. There may, however, be more scope to loosen the reigns of centralised power without any significant impact on its economic strategy. Indeed, we have suggested that an extension of personal freedoms may prove to be a prerequisite to release the creative and entrepreneurial talent it now suggests are required. Paradoxically, the main threat to the PAP's skill formation strategy, *ceteris paribus* is likely to come from the growth of an indigenous business class who are likely to call for an extension of market forces in education, housing, and public amenities. Unless there is an increase in the personal degrees of freedom the political appeal of the business class will be linked to 'setting the people free' from government interference.

Lastly, it is unclear what proportion of the workforce need the creative, self-management and enterprise skills that are assumed to go hand-in-glove with a knowledge-driven economy. What is clearly is that Singapore is not a high skills economy but it has a high skills strategy. Equally, the pundits of global convergence who harbour a neo-liberal free model of world development will continue to be frustrated by Singapore's approach to developmental capitalism. Its rapid return to growth after the Asian financial crisis suggests that its approach is robust when set to sea in the gale of destructive capitalism!

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¹ Between the middle of 1997 and 1998 the Singapore dollar fell 16 per cent against the value of its US equivalent, and the Singapore stock market fell by 54 per cent. By the end of 1998 the economy was barely growing at all, but has since enjoyed robust economic growth.

² See Koh, T. (1998) 'Size is not destiny', Appendix 1, p.181, in A.Mahizhnan & Lee. Tsao Yuan (Eds.) Singapore: Re-engineering Success, Oxford University Press.

³ The fact that Singapore did not start from an 'agrarian or raw material base' led Alice Amsden to argue that Singapore does not fit this paradigm.³ Although modern day Singapore began as an entrepot economy and as a military hub for the British, it appears to have much in common with the development of the other Asian Tiger countries. Indeed, Ashton et al (1999) have argued that Singapore represents the archetypal model of what they call 'developmental skill formation'.

⁴ The idea of 'pressure points' and 'trade offs' is discussed in the paper, along with our definition of skill formation as the social capacity for learning, innovation and productivity. The ideas presented in this paper also relate to our theory of 'collective intelligence' (Brown and Lauder, 2001). See also Brown, P., Green, A., and Lauder, H. (forthcoming) *High Skills: A Comparative Study of Globalization, Competitiveness and Skill Formation*, Oxford: Oxford University Press.

⁵ To Western observers it may seem surprising to note the direct absence of the sectional interests of capital and labour not being the basis for a political settlement based on the prospect of prosperity for all and the upgrading of skills.

⁶ Lee Kuan Yew in Straits Times 23 March 1996. Quoted in L.Low (1998) *The Political Economy of a City-State: Government-made Singapore*, Singapore: Oxford University Press, p.218.

⁷ Philip Yeo is CEO of the EDB, Singapore. Quoted in Edgar, Schein 1996 *Strategic Pragmatism: the culture of Singapore's Economic Development Board*, Cambridge, Mass: MIT, p.162. He also observed, 'Economic development means job creation. Jobs create prosperity and the rest, quality of life, etc., follow. If you have no jobs, there is no quality of life to speak of. No higher standard of living to aspire to, *ibid.*, p.114.

⁸ During the same period Agriculture and quarrying fell from 7.1 per cent of employment to under 1 per cent in the 1980s. However, the service sector encompassing commerce, financial and business services, transport and communications accounted for almost 70 per cent of employment in the early 1960s, declining to 63.2 per cent in the 1980s only to recover to the approximately 70 per cent in the mid-1990s. See Table 2.1 Real GDP, Industrial Structure and Employment by Phase, in Low, L. (1998:47).

⁹ Committee on Singapore's Competitiveness (1998) Ministry of Trade and Industry, p.3.

¹⁰ This is part of the Prime Minister's letter of response on receiving a copy of 'Committee on Singapore's Competitiveness', 1998, Ministry of Trade and Industry, reprinted at the beginning of the Report.

¹¹ Committee On Singapore's Competitiveness, Ministry of Trade and Industry, Singapore, Nov. 1998, p.6.

¹² See Singapore Economic Development Board Annual Report 1997-8.

¹³ Singapore Economic Development Board Annual Report 1997/8 (www/sedb.com.sg/who/mfg.html).

¹⁴ Singapore Economic Development Board Annual Report 1997/8 (www/sedb.com.sg/who/intlbuz.html).

¹⁵ Singapore Economic Development Board Annual Report 1997/8 (www/sedb.com.sg/who/i21g.html).

¹⁶ Lee Kuan Yew, Speech reported in the Straits Times, 9 December 1959, quoted in Gopinathan, S. 'Education and development in Singapore, in Tan, et al. 1997, p.41.

¹⁷ Lee Kuan Yew (1966) New bearings in our education system. Prime Minister's speech to the Principals of Schools, 29 August, quoted in John Yip Soon Kwong, Eng Soo Peck and Jay Yap Ye Chin, '25 years of educational reform', in Tan, et al. 1997, p.4.

¹⁸ Goh, Keng Swee et al. (1979) Report on the Ministry of Education, 1978, Singapore: Ministry of Education, quoted in John Yip Soon Kwong, Eng Soo Peck and Jay Yap Ye Chin, '25 years of educational reform', in Tan, et al., 1997, p.17.

¹⁹ See Yearbook of Statistics Singapore, 1997, Singapore Department of Statistics, Ministry of Trade and Industry, 1998, Tables 18.11 & 18.12.

²⁰ Productivity and Standards Board figures.

²¹ Productivity and Standards Board, (1998) PSB Annual Report 1997-1998, p.45. The tax was reduced in 1986 from 4% to 2% and then to 1% for all workers earning below \$1000 a month. This accounted for around 20% of the workforce in the late 1990s. Most of the training programmes offered by PSB at subsidised to the tune of approximately 80% of costs (PSB interviews). [www.psb.gov.sg]

²² A PSB brochure for the Crest Programme boldly states 'knowledge is doubling about every 3 years and 50% of what one has learnt in school will become obsolete in 5 years'. This is clearly a gross exaggeration as a general description of the changing state of knowledge, but it does capture a key element of the discourse of the knowledge economy; the continuity of 'discontinuous' change.

²³ Interview with the Ministry of Education, Education Technology Division.

	A-level graduate		Polytechnic Graduates	
	2002	2004		2002
A-Levels	75%	65%	Polytechnic Results	60%
SAT 1	25%	25%	SAT 1	25%
Project Work	--	10%	O levels	15%

Extra-C Activities Bonus Bonus

Reported in The Sunday Times, Singapore 10 January 1999.

²⁵ They are as misleading as those that assert that globalisation is largely a fiction and that nation states continue to have decisive power over the economic fate of their citizens (see Hirst & Thompson 1996; Held, et al.1999).

²⁶ Interview notes.

²⁷ See Tables 11.2 and 11.3 from Low, L. and Ngiam Tee Liang (1999) 'An underclass among the overclass', in Low, L. (Ed.) *Singapore Towards a Developed Status*, Singapore: Oxford University Press, pp.238-39.

²⁸ There is a standing joke in Singapore that the ruling party the PAP really stands for 'pay-and-pay'.

²⁹ Ministry of Trade and Industry (1998) Committee on Singapore's Competitiveness, p.3.

³⁰ Ministry of Trade and Industry (1998) Yearbook of Statistics, Singapore 1997, Table 21.4 p.263.

³¹ Figures from General Household Survey 1995: Socio-Demographic and Economic Characteristics, Singapore: Department of Statistics, 1995, Table 11. p.29

³² Reported in the Straits Times, 28 April, 1971, p.3. Also in Schein (1996), p.174.