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Information Literacy as a National Agenda: A Case Study of Singapore

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Introduction

Singapore is a small country in South East Asia with a population of some 3.7 million. It achieved independence from Britain in 1965 and since then has made remarkable progress as a nation, so much so that other countries are now looking closely at its policies with a view to discovering its secrets of success. While the policies attracting attention range from Singapore's national pension scheme to the way in which traffic flow is controlled, the major area of interest here is to investigate the country's promotion of information literacy.

Singapore is largely devoid of natural resources, so there has always been an emphasis on seeing people as capital. As in many Asian countries, cheap labour was at first the basis for building strong manufacturing industries to earn revenue by exporting goods to richer nations. Economic growth would occur as long as inputs of labour and of capital investment went on growing, but eventually this would slow because the sources of these inputs are finite. Krugman (1994) described this as the "perspiration theory": success was based on working harder, not working smarter. Krugman's writings aroused hostile reaction in many Asian countries, but even he did not predict the extent of the economic crisis in the region during the late 1990's. By this time, though, Singapore's leaders were working on the problem and laying the foundations that would produce a workforce with something more to offer than perspiration.

Vision and Programs in Singapore

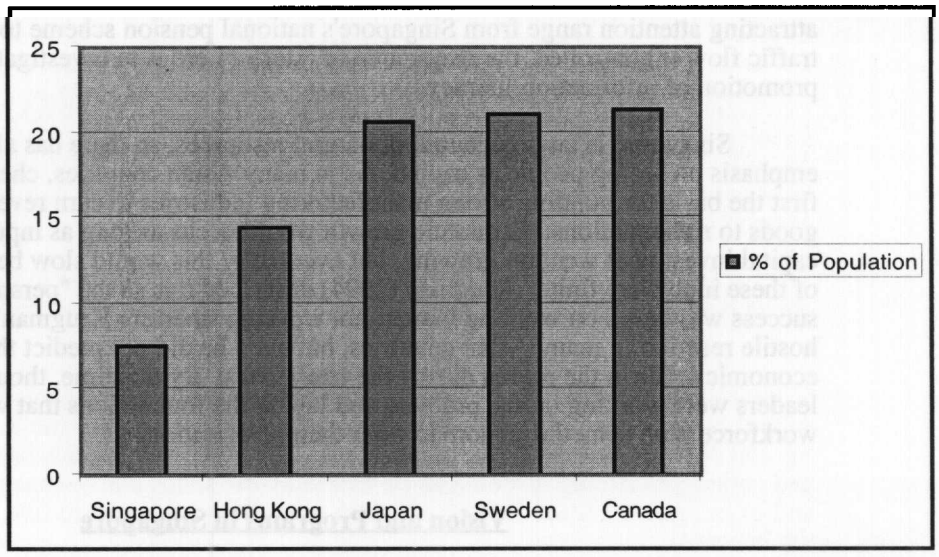
Singapore was one of the first countries to produce a coherent information policy. In 1993 Prime Minister Goh Chok Tong noted that "the future belongs to countries whose people make the most productive use of information, knowledge and technology. They are now the key factors for economic success, not natural resources"(Goh, 1993). Member of Parliament Ho Kah Leng offered another example of government rhetoric dwelling on the same theme: "Our continued competitiveness is dependent on a population which makes a conscious effort to learn throughout their lives" (Ho, 1996).

This type of speech has been heard many times as politicians encourage their citizens to improve themselves. It is a notion that none of their opponents can disagree with. But it remains a politically neutral statement as long as there are no resources to allow real implementation. What makes Singapore different is that a governmental statement of this sort is in effect a mission statement that is closely followed by a blueprint for action and a budget commitment. This is because there is a clear rationale. The country cannot afford inaction: information literacy is linked to future economic success.

Economy

Singapore, whilst still keeping a manufacturing base, has chosen to concentrate upon "high-end" manufacturing such as disk drives, semiconductors, silicon chips, and other areas that have the most value-added content. "Low end" enterprises such as clothing manufacture have been driven offshore, predominantly to the Indonesian Rhiau Islands to the south. In addition, Singapore is actively engaged in expanding into new service industries such as biotechnology, financial services, media, entertainment, and e-commerce. These have two things in common: they both require a substantial initial investment and they need a highly adaptable workforce capable of being retrained.

In reality, Singapore has a population that, in the main, left school early and without adequate qualifications for the types of industry envisaged by the government. The percentage of the population aged over 25 with post-secondary education is very low compared with other developed countries (see Figure 1 below):



Source: UNESCO Statistical Yearbook, 1998.

Figure 1. Percentage of Population Aged 25+ with Post-Secondary Education

This problem is being addressed. By the end of 1999 about 60% of those leaving school continued their education, some 21% attending university and 40% going to polytechnic. For some years to come, however, a large section of the population will remain without formal educational qualifications and will therefore continue to require special attention in developing information literacy skills.

Strong Financial Base

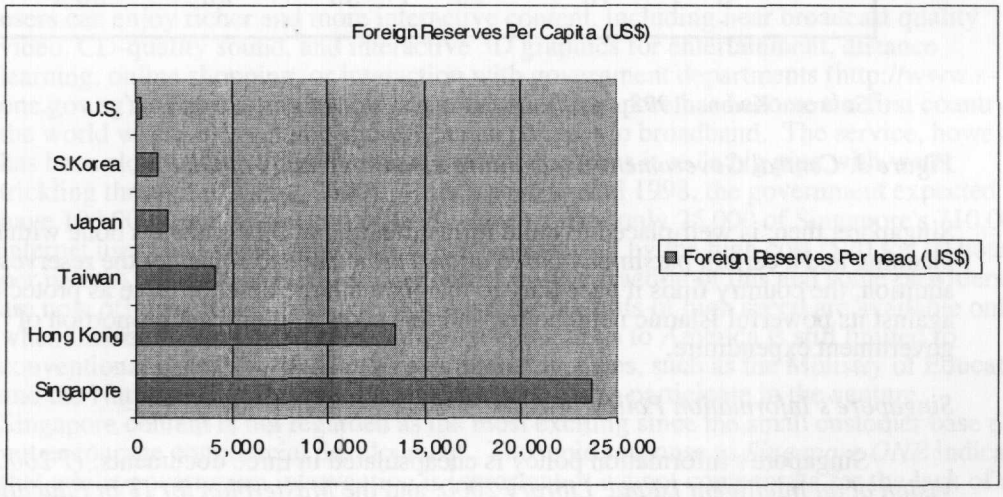
It is important to not that Singapore is in a very strong financial position when it comes to implementing its policies. The

island state has one of the largest stocks of foreign reserves in the world, larger even than the United States in absolute terms, as Table 1 shows:

Table 1
Foreign Reserves

Country	Per Capita (US$)	Total (US$m
Singapore	23,685	74,928
Hong Kong	13,475	89,610
Taiwan	4,144	90,341
Japan	1,714	215,471
S.Korea	1,120	51,975
U.S.	262	70,710

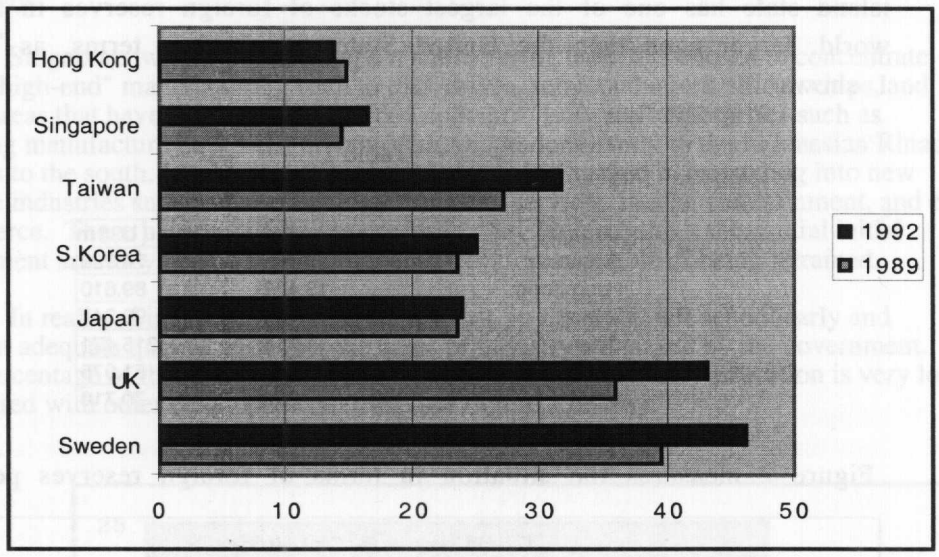
Figure 2 measures the situation in terms of foreign reserves per capita:



Source: Economist Intelligence Unit. Country Report: Singapore, 1999-2000.

Figure 2. Foreign Reserves

These reserves are largely the product of the compulsory national superannuation scheme, known as the CPF (Central Provident Fund), to which employees contribute 20% of their earnings and employers currently contribute 12%. There is no state pension as such. Indeed all welfare payments are kept to a minimum. In the years following independence, Prime Minister Lee Kuan Yew's policy was to provide the social infrastructure, in the form of housing, education, and healthcare so that the stable conditions and the disciplined, industrious workforce would attract foreign investment. There were to be no transfers of cash or services to a social underclass. An ethic of self-reliance, resting on family support, was emphasised from the start. Indeed the term "welfarism" had pejorative overtones when comparisons were made to traditional western welfare states. Public expenditure was kept fairly low and grew only slowly as the country became more affluent, as shown in Figure 3:



Source: Kwon, 1998, p. 28.

Figure 3. Central Government Expenditure as a Percentage of GDP

Singapore, then, is well-placed to build infrastrucure, but this is always done with careful planning and a certain parsimony based upon a reluctance to squander the reserves. In addition, the country finds it necessary to maintain a large defence force as protection against its powerful Islamic neighbours, and this takes a significant proportion of government expenditure.

Singapore's Information Policy

Singapore's information policy is encapsulated in three documents: *IT 2000: A Vision of an Intelligent Island, Library 2000,* and the *Masterplan for IT in Education.* The first document, *IT 2000*, was one of the earliest national information plans and the most clearly articulated. Published in 1992, it set the framework for a National Information Infrastructure that would touch the lives of all citizens. It bears some of the hallmarks of a Delphi study in that it tapped the practical and visionary experience of some 200 senior executives representing 11 eleven major economic sectors in Singapore. It described a range of areas in both the public and private sectors where information technology (IT) could be pervasively applied to improve both economic performance and quality of life. By the year 2000 it was expected that Singapore would, indeed, have become an intelligent island with electronic transactions replacing manual and paper processes and with a computer network linking virtually every home, school, office, and factory. A critical appraisal of *IT 2000* is provided by Soh, Neo and Markus (1993) who found that the planning process was rather top-down, with the bulk of work being carried out by personnel of the National Computer Board. A more favourable comment came in a comparison of Singapore's information policy with others in the region (Moore, 1995) that concluded that Singapore's integrated approach to planning was the most effective and was already showing demonstrable results far ahead of other countries.

Computerising an Island

The NCB (National Computer Board) tackled the task of computerising an island by making the civil service the most automated in the world. Subsequently, the focus changed to promoting an IT culture in the country as a whole, as this 1999 extract from its webpage shows:

> *To be successful in our* IT2000 *vision, we must be able to bring IT to the man in the street. Our priority target group is the school-going children. The NCB will work with government agencies, the industry and the mass media to bring about greater IT fluency among Singaporeans. Comprehensive educational and promotional campaigns will be introduced to improve IT literacy. These initiatives include organising IT roadshows and exhibitions aimed at the masses, accelerating the use of IT in schools and developing new programmes to reach out to the workforce.*

The linchpin for attaining these objectives is *Singapore ONE* (One Network for Everyone), a multimedia broadband cable network that reaches every home on the island. Using the latest digital technologies, it delivers information to subscribers at 100 times the speed of normal Internet dial-up via a modem and the phone lines. This means that users can enjoy richer and more interactive content, including near broadcast quality video, CD-quality sound, and interactive 3D graphics for entertainment, distance learning, online shopping, or interaction with government departments (http://www.s-one.gov.sg). The cabling is now complete and Singapore has become the first country in the world where every home and office can connect to broadband. The service, however, has been slow to take off. One commentator describes it as "a big pipe with water trickling through it" (Ang, 2000). At its launch in mid 1998, the government expected to have 100,000 users by the end of 1999. By that date only 25,000 of Singapore's 710,000 Internet users had signed up. This is partly explained by the high cost ($20 for 10 hours per month), whereas regular Internet access costs a fraction of this and some providers are now offering free access. Furthermore, the benefits of high speed are available only when linking to Singapore sites, while the connection to America is still limited to conventional channels. Although government agencies, such as the Ministry of Education and the National Library Board, are under pressure to participate in the venture, Singapore content is not regarded as the most exciting since the small customer base does not encourage commercial development. The tepid response to *Singapore ONE* indicates that whilst government intervention is important, it cannot compensate for the lack of an entrepreneurial private sector in this type of enterprise. Meanwhile, the National Computer Board, so influential in the early success of Singapore's information policy implementation, has now been re-named the Infocomm Development Authority of Singapore in recognition of the changing information landscape and its dependence upon telecommunications.

Expanding the Public Library System

When the second key document, *Library 2000: Investing in a learning Nation,* was published in 1994 it marked a watershed in the history of public library development in Singapore. The document was both a dispassionate assessment of the status quo and a blueprint for change. Most importantly, it was a signal of intent, a statement made at the very highest level that libraries and information were to play an important part in national development. It can also be regarded as a SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats) in its assessment of factors inherent in the library system at that time and in the environment in which they operated. As such, it provides significant documentary evidence that places the subsequent changes in context.

The report was produced by the *Library 2000* Review Committee, which began work in June 1992, charged with the following brief:

> • *to formulate a masterplan for developing library services over the next ten years, defining the services, infrastructure and target audience, which the libraries in Singapore must address;*
> • *to determine how information technology can be fully exploited to facilitate libraries to play a relevant role in the emerging information society;*
> • *to review library manpower and the skills needed to implement library development;*
> • *to propose an organisational strategy for the National Library.* (*Library 2000,* p. 122)

The subtitle of the report, *Investing in a learning Nation,* has significance. A key objective was to "promote a well-read and well-informed society", (ibid, p.122). The planners clearly recognised the role that libraries play in collecting and disseminating knowledge, in encouraging self-improvement, in acting as repositories for the nation's cultural heritage, and in providing gateways to global information sources. In effect, libraries would complement and reinforce the nation's education system and skills upgrading programme, which was seen as vital for maintaining Singapore's competitive edge in the region. The word *investing,* which appeared in the subtitle, not only indicated that a considerable injection of funding would be needed but also implied that a pay-off was both expected and assured.

The report recommended six strategic thrusts:

- An adaptive public library system
- A network of borderless libraries
- A co-coordinated national collection strategy
- Quality service through market orientation
- Symbiotic linkages with business and community
- Global knowledge arbitrage.

These thrusts would materialise in the form of a vastly improved public library system with a new National Reference Library, including specialised business and arts reference libraries, and a three-tier lending library system of five regional libraries, 18 community libraries, and 100 neighbourhood children's libraries. The intention was to provide easy access to books in all residential areas of Singapore by ensuring that there would be a public library outlet within walking distance of all Mass Rapid Transit (MRT) stations and bus interchanges.

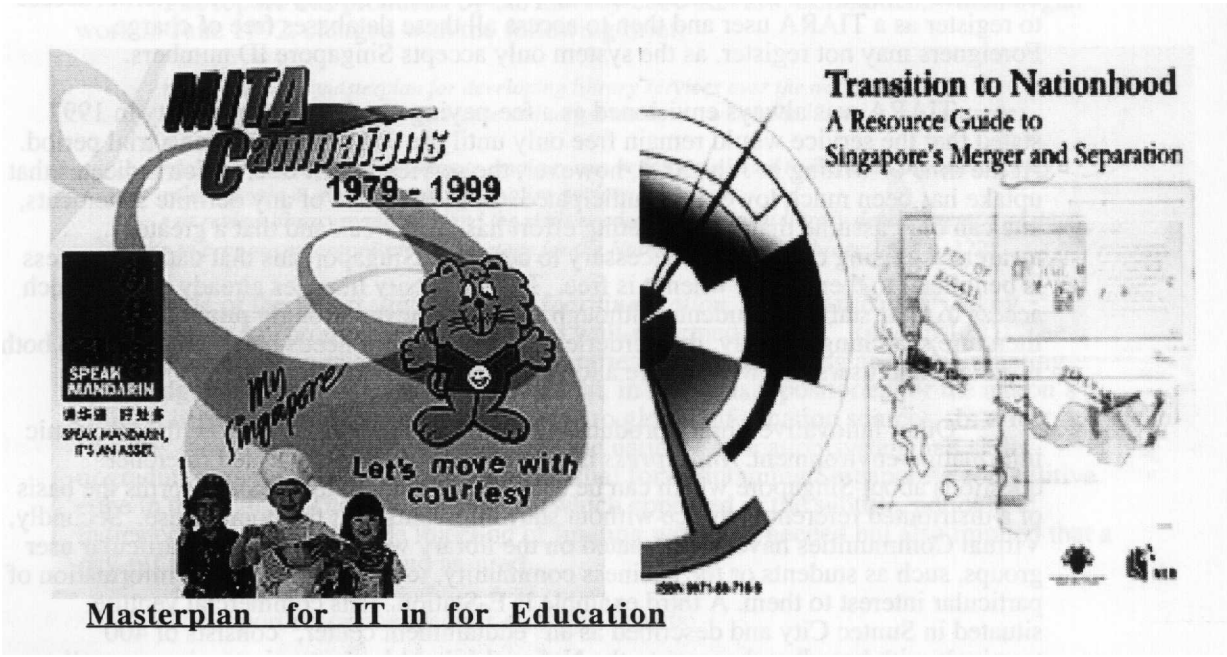
As well as improving physical access, a great deal of attention has been paid to developing innovative library services, which depend upon electronic, access. By bringing reality to the term "virtual library," a whole new audience could be targeted, an audience which may not have used traditional libraries before. The basis for the borderless library network envisioned in *Library 2000* became known as TIARA (Timely Information for All in a Relevant and Affordable manner). "Ask TIARA" is a facility whereby users can pose reference questions that are routed to the National Reference Library. There is an SDI (Selective Dissemination of Information) service, known as "Hot Topics," that alerts registered users to the latest news and articles on trends and developments in areas such as business, education, health and medicine, management, science and technology, information technology, and intellectual property. There is even a facility known as "Tiara's Children" that provides access to selected and safe Internet sites for students who need information for homework or project work. Furthermore, contracts were signed with the large information providers (i.e., Dialog, Elsevier, Reuters, Gartner, Faulkner, and Engineering Information) that allowed their

databases to reside on the system. This allows anyone in Singapore with Internet access to register as a TIARA user and then to access all these databases free of charge. Foreigners may not register, as the system only accepts Singapore ID numbers.

TIARA was always envisioned as a fee-paying service. The publicity in 1997 stated that the service would remain free only until the end of that year, as a trial period. At the time of writing in July 2000, however, the service is still free, which indicates that uptake has been much lower than anticipated. In the absence of any definite statements, one can only assume that the marketing effort has been weak and that a greater awareness-raising campaign is necessary to convince Singaporeans that database access is beneficial to them, even when it is free. The university libraries already provide such access to their staff and students, although they have never strongly promoted online literature searching. Clearly, the borderless library concept needs better marketing to both librarians and users and will require a longer lead-time to accomplish.

Other innovative library products have allowed patrons to explore the electronic information environment. *InfoXpress* is a database of frequently asked reference questions about Singapore which can be accessed in branch libraries and forms the basis of a distributed reference service without staff intervention at the point of use. Secondly, Virtual Communities have been created on the library website that allow particular user groups, such as students or the business community, to interact and obtain information of particular interest to them. A third example is E-Station. This commercial venture, situated in Suntec City and described as an "edutainment center," consists of 400 terminals with broadband access to the National Library's electronic services as well as other facilities for education, training, and multiplayer computer games. It is hoped that this mix of business and pleasure will attract wide usage and promote the Internet "as a focal point for both work, education and entertainment pursuits," (NLB Press Release, 29 January 2000).

Finally, attention has been given to Singapore's heritage and the National Library Board (NLB)'s responsibility both to preserve and to make available key historical documents. One means of allowing greater public access to these is a CD-ROMs series known as "Fact Finders," a collaborative effort between the NLB, the National Archives of Singapore and the Ministry of Information and the Arts. To date, two CD-ROMs have been produced. *Transition to Nationhood* is a resource guide to the events of Singapore's merger with and separation from Malaysia at the time of gaining independence from Britain. The contents are derived from a range of resources including newspapers, official documents, speeches, photographs, and sound recordings. The second CD-ROM, *MITA Campaigns,* recognises that there is great interest both at home and overseas in Singapore's national campaigns such as Courtesy, Speak Mandarin, and No Littering. The content is based upon posters, ephemera, photographs, videos, and sound recordings spanning the twenty years from 1979 to 1999. One interesting aspect of this exercise is that the NLB has decided not to sell these CD-ROMs because it regards the electronic content as a valuable asset that might be "pirated" after sale. Instead they will be made available to schools and other institutional libraries as well as throughout the public library system, where their use can be monitored, (Salleh, 2000).



Reforming the Educational System

The third aspect of Singapore's strategy to increase information literacy involves a major reform of the education system. The *Masterplan for IT in Education,* published in 1997, is underpinned by a desire to ensure that schools move from a content-based curriculum dependent upon rote learning to a system that produces creative thinkers. This is a response to a realisation at the highest levels that, although Singapore is now proficient at producing high-tech goods, not enough effort is being directed to creating new technologies. The *Masterplan* relies heavily on competencies in IT and Internet usage, and teachers are being re-trained to integrate these into all learning areas. A target is in place for a pupil:computer ratio of 2:1 by the year 2002. There appears to be an assumption that creativity will follow from this and that allowing students greater access to the Internet will make them into independent learners.

A weak link in the chain is that Singaporean schools lack dually qualified teacher-librarians with a full time commitment to the library. For too long, the school library has been seen as an extra-curricular activity and has not been given adequate staffing. In countries such as Australia and Canada, teacher-librarians have acted as change agents who are able to promote research skills on a school-wide basis. One local librarian turned educator has noted the problem (Choy, 1998): the net result will be smart schools in which pupils have access to as much information as teachers. There is a danger, though, that the whole system could explode from an over-stimulated overload, to put it in engineering terms. What is required is some means of selecting and organising the information input and passing these discriminatory skills onto pupils.

Singapore is relying on pilot projects in a few selected schools. These act as testbeds for new ideas so that good practice can develop at one location and spread outwards. In Stage One there were 22 demonstration schools (ten primary schools, ten

secondary schools, and two junior colleges) set up to enable "experimentation at the frontiers of IT-based learning" (*Masterplan*, section 42). Their task was to provide the rest of the school system with concrete local models of innovation in teaching, learning strategies, and school administration. Earlier pilot projects incorporated into the plan included the Students' and Teachers' Workbench (STW) that experimented with a fully IT-based curriculum in Secondary One Science, a curriculum area that lacks sufficient specialist teachers, and provided a central repository of educational resources and lesson packages for teachers. Whilst the reforms in Singapore are too new to see results yet, it will be easier to achieve computer literacy than to achieve creativity (Nye, 1999). Nevertheless, there is a general feeling that positive outcomes will arise from a concentration on adequately resourced change in the educational sector.

Conclusion

Singapore is often accused of having a top-down approach in both the way the country is governed and the way large institutions are administered. There is no lack of effort, however, in providing the public with detailed information about policies, and the media are willing partners here. This might be described as raising awareness by some and as propaganda by others. The other noteworthy feature of the measures described above is the fact that government first builds a solid infrastructure. It then relies upon the synergy created by public/private collaboration to amplify the effect.

There is no doubt that information literacy should be on all national agendas. Bundy (1999) described it as the "twenty-first century smartcard. Although programs to develop the educational attainment of all citizens will pay off in the long term, politicians in many countries refuse to go beyond rhetoric and allocate adequate resources to this. In Singapore, implementation of programs has been made easier by virtue of its being a small country with no viable political opposition. This means that policies are more quickly implemented and more readily available for evaluation by observers and commentators. It is an ideal case study for the rest of the world.

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