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## Introduction

The last few years have seen a radical process of 'restructuring' of school systems taking place in many industrialised countries. A major impetus for this restructuring is undoubtedly economic © that schools have been perceived by governments as not serving the needs of the economy and in some ways actually being responsible for economic decline. Responses to this 'crisis' in education, notably in the USA , are generally believed to have come in two phases. The first phase was characterised by a belief that schools could be 'repaired' , partly by the application of selective characteristics gleaned from

'effective school research. In recent years, this view has been overtaken by a second phase characterised by the belief that nothing short of a restructuring of schools and school systems is required. In its repair mode, reform, and associated effective school research, can be said to have been concerned with organisational changes to meet conventionally and narrowly defined performance indicators. On the other hand, in restructuring mode, reform has been broadened to include the aims of education in a changing world, about whether ways of organising schooling to meet the needs

of an industrial society will be relevant to meeting the needs of a post-industrial society ( Beare & Boyd, 1993; Murphy, 1991 ).

In this paper we apply the concepts of repair and restructuring to explore the development of effective schools in Singapore. To do this, it is necessary to invert the relationship between repair and restructuring. Our argument is that in the case of Singapore, national survival necessitated a fundamental restructuring of the education system very early on in the life of the Republic, and that this was followed by a period of repair, or what in Singapore is termed 'fine tuning', during which the education system was progressively refined. During this period, which we the authors argue lasted until the mid-1980's, many of the research findings of the effective school movement were implemented. The result, we argue, was that by the mid 1980s Singapore had developed a highly efficient educational system that was achieving impressive educational results and meeting the needs of a rapidly industrialising economy. Not only had the island become effective, but so too had its schools. Mortimore's ( 1991) definition of an effective school as "one in which students progress further than might be expected from a consideration of intake" accurately describes the achievements of the island itself. In the mid-1980s, however, Singapore experienced a short, sharp recession that raised questions about the relevance of its educational system for what were perceived to be the challenges posed by other newly emerging regional economies, especially

in the area of manufacturing industry. It was realised that if Singapore was to survive the focus of its economy needed to be shifted towards knowledge-based industries, that industry needed to globalise, and consequently that changes needed to be made to its educational system. In the years following this short, sharp recessionary shock, the education system has entered into a transitional phase, characterised by further repair but also by a new restructuring that would appear to be a response to new economic challenges facing the nation, challenges that are embodied in concepts such as "globalization" and "networking". How such notions might be transported into the school system, and how they might affect conventional notions of effective schools is explored towards the end of the paper.

#### The Economic Imperative

The spectre of economic decline appears to have been the driving force behind recent school reforms on a world wide level. This is the conclusion arrived at by Beare and Boyd (1993) in their survey of school reconstruction in six developed nations. Countries such as the

USA and the UK, which erstwhile had enjoyed relatively decentralised systems of education, where schooling and industry were clearly separate, and where issues of equity and justice had dominated educational discourse, were, in the late 70's and 80's, forced to place economic concerns at the top of their agendas. In the United States, for example, the publication of 'A Nation at Risk' (National Commission on Excellence in Education, 1983), articulated a causal linkage between economic decline and schooling and provided the ideological justification for education to be taken out of the hands of professional educators. Education had entered the realms of 'High Politics' (Koppich & Guthrie, 1993).

#### The Emergence of the Effective State

The spectre not only of economic decline but also of political catastrophe was undoubtedly

the driving force behind educational reconstruction in Singapore also.

But, unlike in developed countries, the economic challenge was experienced earlier and in a much more acute form. In one of the most dramatic turnarounds in contemporary post-colonial history, an ethnically divided, small, impoverished state became a much sought after model for order, effectiveness, efficiency and progressive development. Singapore's success as an effective post-colonial state, and the role of education in the transformation provides interesting insights into the complex relationships between state development and education.

Though there is much in the current US and UK literature about the need to restructure education so as to promote economic development and thus to strengthen the state i.e. make it more effective, there is little information about how a mixture of state-building and effective education policies have helped to make new states like South Korea, Taiwan and Singapore effective.

The Singapore state had originally poor prospects for effective national development. While colonial policies had created a rich and supportive environment for business and commerce, poor social policies and a lack of commitment to transform society for the better resulted in a deeply divided plural society segmented along race, linguistic, religious, settlement and occupational lines. Education was a particular bone of contention during the colonial period. British policy was centred around supporting Malay medium education and aiding missionary bodies to provide English medium education while leaving Chinese and Tamil schools to fend for themselves. The Chinese were resourceful and had the numbers to enable them to build up a viable Chinese-medium school system. However, between 1900-1930, as a result of

major social-political upheavals in China, notably the 1911 Taiping Rebellion and later, the May Fourth movement, Chinese schools in Singapore became politicised and often, violently anti-colonial. British efforts at control and increased pressure to use English as a medium of instruction only incensed the Chinese further.

Thus, the post-war inheritance was a deeply divided society, with large segments of the population hostile to the departing British and the successor-English educated elite. There was even a belief that Singapore was not viable on its own and the only logical political future was to affect a merger with Malaysia. Other characteristics made survival problematic. Singapore is a small island dwarfed by Indonesia and Malaysia which are both predominantly Malay-Muslim compared with Singapore's dominant Chinese majority. In terms of population and resources, Singapore was disadvantaged as well. In the early fifties, Singapore was a state characterised by acute underdevelopment, aggravated by a rapidly rising population rate, of about 4 percent, and this was accompanied by severe unemployment. Communist-influenced trade unions went on strike at will, further worsening the economic climate. Thus, on the political, economic, social and educational fronts, Singapore was faced with immense problems.

The developmentalist challenge that faced the P.A.P. government in 1959 was to make the state secure. It promoted a political merger with Malaya in the hopes of winning an economic hinterland. But the merger was rocky from the start and Singapore was expelled in 1965 after 2 short years. Not only had the leaders to contend with this disaster but the years in Malaysia had intensified ethnic tensions.

How did Singapore succeed given such poor prospects? Principally, it did so by visionary leadership, careful attention to macroeconomic policies, an ability to plan and implement, the ability to keep intact but transform the civil service, and a steely determination to root out disruptive and oppositional elements be they in such areas as the trade unions, media or schools. Several elements may be singled out in 'explaining' success. One is that the Singapore leadership realised that it had no choice but to succeed since the alternative was socio-political disaster. Policies had to be formulated that addressed the principal dilemma of turning a 'political joke' into a viable state. The necessary politics of survival enforced its

own discipline. Added to this was the belief of new political possibilities. The end of empire was near and great anti-colonial nationalistic movements in, for example, India, Indonesia and Ghana, promised new eras shorn of servitude. Many of the PAP's

key group of leaders were English-educated, imbued with the post-war idealism to build new and more equitable societies. There was a strong belief, carried through to this day, that a strong government could engineer a strong society. Finally, many of the leaders had knowledge of the needs and working of modern society © Lee Kuan Yew had studied law, Goh Keng Swee economics and social policy, Rajaratnam worked in the media, Devan Nair was a teacher and trade unionist, Toh Chin Chye, a trained scientist. Above all else, these leaders were committed to a pragmatic ethic © perhaps because they saw in their political opponents the effects of a blinding commitment to ideology. Thus, a unique combination of men with different talents and life experiences, tempered by a fierce political struggle were able to overcome the risks and seize the opportunities for nation building.

To be effective in the political sphere, that is to win legitimacy, they had to outflank the communists and chauvinists, which they did by committing themselves to social democracy and multiculturalism. This enabled them to use anti-subversion laws to limit their political opponents. Their political victories always appeared less than definitive since the political ground could only be held by greater economic growth and wealth distribution.

Effective policy making in the economic sphere lay in recognising Singapore's economic limitations. Singapore had an advantageous geographical location amidst the world's busiest shipping lanes, naval dockyards and little else. Singapore needed capital, technology and markets and industrial peace. Going against the anti-colonial grain of the times, Singapore chose to welcome multinationals to help it develop an industrial economy. It quickly drafted legislation to control the trade unions, to ensure industrial peace, and instituted a higher

savings policy. The state itself undertook economic activity, investing in airlines, shipyards, printing and banking, among others. It built and managed industrial parks and it assisted its trade union allies to become a major conglomerate. Most importantly, it found good men to plan and manage these activities and enterprises and who insisted on efficiency and effectiveness.

Concomitant with massive state investment in the economy, the government also invested in social development. A Central Provident Fund was established to boost savings and with the establishment of the Housing and Development Board, an ambitious flat building programme and policies to boost home ownership were launched. Other investments went into areas like transportation, and especially the building up of the Singapore Armed

Forces, which was as much a social project as a military one, as there was great resistance to serve in the armed forces.

### Reconstructing the Education System

What of education? How did the emerging, and increasingly effective state view education? How did it overcome obstacles to establishing an effective system? What, indeed, did it think was effective education?

Firstly, we need to note that the state was faced with an ineffective education system. Being divided into various language medium schools, with different curricula and attainment standards, the schools were hardly an instrument with which to build the cohesive society that Singapore desperately needed. The curriculum was largely a liberal arts one, designed to produce school leavers for the lower ranks of the civil service and largely irrelevant to the needs of the emerging industrial economy. Access was limited, thus limiting the full development of the human resources that Singapore needed.

The principal assumptions and policies on which the education system was reformed can now

be briefly stated. In order that an effective state could be built, the education system had to become an instrument of social cohesion, to provide opportunities for social mobility and to provide the trained manpower that the economy needed. Given the major problems over language status and rights, the government accepted a policy of equal treatment for all four official languages : English, Chinese, Malay and Tamil. The aim was to make all school leavers effectively bilingual. English, though it had colonial association, was recognised as an important economic language. Rather than limit its role in schools to placate the politically powerful Chinese educated lobby, the government set about widening access to English. Next, the government began a major revision of the curriculum, built upon two premises. One was that a common curriculum had to replace the different language based ones. The colonial centric history could obviously not build the common identity that Singapore needed. In addition to developing a curriculum that reflected the nation building aims, and a more balanced account of the contributions of the various ethnic groups in Singapore's past, the government paid particular attention to civics and moral education curriculum, to reinforce the political message of one people, one nation amidst diversity. The second major premise for curriculum change was that education needed to be more tightly tied into economic goals. As Singapore's economic future lay in industrialising the economy, the government place greater

stress in the curriculum on science, mathematics, technical studies and, for the less able, vocational studies.

Yet another major policy change was to increase access to education. Colonial policy had resulted not only in a fragmented system, but also a system with a small secondary sector. General impoverishment and poor primary education facilities resulted in large student drop out rates. Not only was this grossly inefficient, since Singapore's major resource was its manpower, but it also meant that the modernising and liberalising consequences of education were denied to many. Thus, the government began to build more schools,

enrol more pupils,  
enforce greater standardization over curriculum and examinations and  
standardize  
requirements across the different stream schools.

1979 brought to a end this period of radical reconstruction. That year  
saw the implementation  
of the New Education System (MOE, 1979), following the publication of  
the Goh Report  
(Goh, 1979 ). Reflecting the importance attached to educational  
development, and perhaps  
the fact that education is rarely far removed from high politics in  
Singapore, the committee  
was chaired by the then Deputy Prime Minister, Goh Keng Swee. The  
committee addressed  
the problem of "wastage" of talent, due to early school dropouts, and  
introduced streaming  
in both primary schools and secondary schools to deal with it. It  
noted that overseas  
'egalitarian  
models that did not recognise innate differences in children's  
capacities to acquire knowledge produced a system where  
only the brightest 12 per cent to 15 per cent of children  
could cope. Different tracks, with an extra year in secondary school  
for slower pupils to  
prepare for 'O' levels , would be more efficient. As attrition rates  
declined dramatically over  
the coming years, even though schooling remained voluntary, increased  
numbers of students  
were able to benefit from expanded opportunities in postsecondary  
school education, in  
Junior Colleges, polytechnics and vocational training boards.  
(VITBs).

The Goh Report marked a culmination of the period of radical  
restructuring that had been  
begun by the PAP following independence. What had been achieved ?  
Essentially, a diverse  
and divided educational inheritance had been centralised, standardised  
and made relevant to  
the political and economic realities of nation building and  
industrialization. A highly  
regarded national system of schooling had been created; access had  
been broadened and  
tracking established on meritocratic principles. A national curriculum  
had been implemented  
which emphasized English and mother tongue language proficiency, the  
sciences and

technology as well as moral education. Fourteen years later, the Prime Minister was to devote a large part of his National Day address to the problem of the 6.7 per cent of students who still dropped out of schooling before the age of 16 !

## Repair

During the late 70s and early 80s the educational system can be described as having gone through a period of refinement and further standardisation. With regard to assessment, regular annual testing of children was introduced, and a data bank of examination questions was set up at the MOE for this purpose. In 1981 the Research and Testing Division was established to replace the former Research and Statistics Division, and a computerised Pupil Data Bank was introduced. As early as 1979, schools were obliged to produce rolling plans against which to conduct self-appraisal, and periodic school appraisals began to be carried out by M.O.E. inspectors. Annual Staff Reviews (ASRs) by school principals and vice principals were introduced at this time also. Curriculum materials, which had previously been imported from overseas, were now produced locally, with the establishment of the Curriculum Development Institute of Singapore (CDIS) in 1982. As early as 1984, year-long professional programmes were introduced to train school principals and heads of departments for both primary and secondary schools.

By the time of the recessionary setback in the mid-1980s, Singapore had already effected the kind of radical restructuring that was only to be attempted at the end of the decade in England and Wales, in the areas of a national curriculum and regular testing of children. Furthermore, close attention had been paid to the findings of effective school research and each of the five key factors mostly commonly associated with school effectiveness had been put into place (Creemers and Scheerens, 1989). School administrators were being replaced by strong educational leaders who had undergone lengthy professional courses. High expectations for student achievement were accompanied by clear lines of progression. There was an emphasis on basic skill acquisition, especially in languages.

Furthermore, schools were remarkably safe and orderly places. Set within a context of negligible unemployment and high levels of social mobility, and measured in terms of 'O' and 'A' level results, Singapore schools had undoubtedly become effective.

#### Recessionary Set@Back : Repair and Reconstruction

The recession that Singapore experienced in the mid@1980s once again focussed attention on

its economic vulnerability and the need for its educational system to adapt to changing economic conditions. Singapore faced, quite unexpectedly, a short, sharp recession in 1985@6. Real GDP growth dropped from 8.2 per cent in 1984 to a shocking minus 1.8 per cent in 1985. Though economists were later to argue that the recession could be explained by declines in international demand for goods and services, declines in oil and other primary products; and, domestically, rising Central Provident Fund rates, the prospect of a prolonged recession and consequent social costs revitalised the planning elite. New Directions for the economy were mapped out.

The Report of the Economic Committee (1986) noted that the Singapore workforce was less educated than the the workforces in the US, Japan and Taiwan. Fifty three per cent of the workforce had at best primary education. It called for policies aimed at developing more creative and flexible skills, a stress on continuous training and re@training. The relationship between education policies and economic change was further elaborated upon by the Minister for Education in 1986 who noted that emphasis on the basics was unlikely to lead to students acquiring "the facility to remain open@minded, inquisitive and receptive to new ideas".

The response in educational terms was a mixture of continued repair, and a degree of restructuring, as the education system entered a period of transition that has lasted until to™day. This period is perhaps characterised by the beginnings of a realisation that further fundamental changes of some kind might be necessary, but a reluctance

to leave behind a set of assumptions that have been highly successful in the past. The 'Improving Primary School Education' report (MOE, 1991) is a case in point. On the one hand it advocated changes to the streaming policy to delay streaming until primary four, whilst on the other hand allowing all children to proceed to secondary education. The Primary School Leaving Examination became a placement, instead of a selection, examination giving all children the opportunity to have a minimum of 10 years of formal education. Most importantly, children who had previously gone straight to V.I.T.B. from primary school were now to follow a 4 year normal@technical secondary course before undertaking vocational training.

Further signs of a break with the past had in fact come earlier, in the aftermath of the report, "Towards Excellence in Education" (MOE, 1987). Returning from a study tour of exceptional schools in the UK and the USA, the authors of the Report @ secondary and Junior College principals @ argued for a decentralisation of the education system and

for an expansion of choice beyond the existing government and government@aided schools. The immediate effect of their recommendations was the decision to allow selected schools to become independent, initially an option given only to top government@aided schools, but later extended to top government schools as well. Shortly afterwards, the scheme was broadened to include a number of lesser known secondary schools which were to become 'autonomous'. This policy effectively widened choice and introduced variety into an erstwhile highly centralised and uniform system. As with the decision to allow all children a minimum of 10 years education, the decentralisation of the school system was clearly an attempt to break with cherished assumptions of the past. However, shortly afterwards, the MOE released performance data to the local English language newspaper which began to publish league tables, after the British model. These tables attempted to provide the public with a range of information about successful schools, which included information on the

extra-curricula

activities they provided, but the ranking itself was based solely on 'O' and 'A' level results.

Whilst schools were being encouraged to be different, they were at the same time being

judged on the same, traditional criteria. For

middle range schools, a value-added

component was added, by ranking schools according to differences between the

measurement of actual examination results against those 'predicted' on the basis of the

Primary School Leaving Examination (PSLE) scores of their intake.

Despite the attempt to widen the criteria of effectiveness beyond examination results,

the actual ranking of schools in these league tables was based entirely on examination

performance. How much of an added inducement this competitive factor has made has

yet to be documented. However, differences between the top schools continue to be

extremely narrow, suggesting that a threshold in terms of examination performance has

been reached. Looking at the performance of these schools, it appears that no further

improvements are possible while performance is judged solely in terms of examination results.

### The Future of Effective Schools

Now that this threshold has been reached, it is perhaps timely to heed the observations

of key effective school researchers. In their state of the art volume (Reynolds &

Cuttance, 1992), a number of eminent researchers in the field caution that their greatest

challenge in the future will be created by a redefinition of school performance indicators,

as schools attempt to meet the needs of post-industrial economies.

Such is the pace of change that one eminent

commentator, in reviewing the effective school research

literature, has concluded that the only lasting value of the movement are the

principles that it has helped to enunciate, such as the idea that all children can learn and

achieve. Murphy's (Murphy, 1992) scepticism that, "Factors that helped produce high

and equitable levels of student performance under the current system of

schooling might not be those that would work in a different world", is echoed by the foremost English researcher, Mortimore. Mortimore questions whether, "both researchers and policy makers may be restricted to an outmoded model of schooling, " where, " large groups of children and adolescents are controlled by adults; a considerable proportion of time is spent in passive roles; knowledge, and the day, are separated by bells or sirens; assessment is mainly carried out using expensive, formal techniques of testing". He feels that a worthwhile ambition is , "A new model of schooling dedicated to producing effective learners, who are also caring and responsible people. " ( Mortimore, 1992) In the same volume, Reynolds and Packer (Reynolds and Packer, 1992) predict that school effectiveness researchers will find life more difficult in the 1990s because of two factors : firstly the range of outcomes expected from schools by the world of work, especially the need for 'active' individuals who have acquired learning@to@learn skills, an ability to work cooperatively and in a more active, learner@directed mode of operation" will transform teacher@student relationships; and secondly, that given decentralization and site management, the nature of headship and management styles will profoundly change. All of which suggests to them that, "What worked in the 1970s is simply unlikely to travel well to the educational world of the 1990s."

#### The Future of Effective Schools in Singapore

Similar concerns to those raised by the effective school researchers have also been articulated in Singapore. Public examination results have generally reflected increasing levels of achievement (Yip, 1993: 5). However, these results should be seen in context. In an address to the Principals' Conference, Mr John Yip (1993), the Director of Education, urged teachers to get over the one right answer syndrome which had been caused by the overemphasis on examinations. He pointed out that teachers were presented with a challenge if they were to overcome the unfavourable

attitudes in  
Singapore society which inhibited risk taking, initiative and  
enterprise. Yip raised the

question of how these concerns could be addressed without sacrificing  
high academic  
standards.

In supporting the concept of educational change meeting the needs of  
the economy Yip  
(1993) cites Chubb and Moe (1990) regarding what markets will require  
of their workers:

A dynamic economy which is well-suited to modern conditions,  
requires workers  
which are not only technically knowledgeable and well trained, but also  
possess  
the capacity for creative, independent thought and action. For  
technology and the  
requirements of productivity are constantly changing and cannot be  
learned once  
and for all.

To these worker requirements can be added entrepreneurship and  
corporate skills which  
demand high level verbal and non-verbal communication and abilities to  
negotiate and  
work with others.

Yip's comments refer to what we have identified as the essential  
dilemma in the  
Singapore education system. Some educational policies and guidelines,  
such as those on  
autonomy and decentralisation are already in place, whilst others such  
as changes to  
examinations still need to be put in place. The essential dilemma is  
that, whatever the  
implications for change in the education system are, they must take  
place in a context  
where standards must not be compromised.

#### A Change in Emphasis for Learners

To provide a framework for reviewing some future implications for the  
education system  
we should review what it means to have a change in emphasis for learning  
in Singapore. However, in identifying exactly what  
changes are required we need to first address the  
implications for the learner. Yip (1993) has stressed the importance

of developing in Singaporean students such qualities and abilities as independent thought and action, initiative, creativity, spirit of enterprise and the ability to think. Moreover, he highlights the importance of application of skills, problem-solving, decision-making and autonomous learning. These qualities are acknowledged to represent a change in emphasis for learners in Singapore. What can be inferred from learning theory about the use of appropriate teaching and learning, and assessment strategies ?

The implication of developing qualities that Yip (1993) asserts to be important such as initiative, decision-making and problem-solving requires students to change from a

passive role to a more active learning role. Based on the work of Marton and Saljo (1976), Biggs (1989) and Ramsden (1992) we can differentiate between a deep approach to learning, focussing on meaning, and a surface approach to learning, focussing on random recall of facts. The question is: how are Asian students perceived to learn. There is a view that such students cannot engage in deep learning or consequently undertake problem-solving activities. We should be cautious and not believe that there is such a thing as an 'Asian mind' (Ballard and Clanchy, 1984; Murphy, 1987, Samuelowicz, 1987). Evidence supports the fact that Asian tertiary students are no different to any others and that their responses are socially constructed by the learning environment. Many researchers have now shown that Asian students can use a deep learning approach (Kember and Gow, 1991; Biggs, 1990, 1991, 1994; Chang, 1992). Indeed they show a higher preference for deep learning strategies than Western students. However, Kember and Gow (1991) have also shown that for Hong Kong students the deep learning approach diminishes over the period of their course, indicating that students accommodate to the requirements of the assessment. The importance of the learning environment is stressed by Biggs (1991) who found that students engaged

in a  
problem-based medical course were lower on rote and higher on  
meaningful learning  
approaches. As Biggs (1994) summarises:  
This last finding, supporting as it does the  
conventional association between  
environment and approach to learning, as it were validates the  
remaining studies,  
which collectively point to a low propensity for rote learning and a  
strong meaning  
orientation in the general run of CHC ( 'Confucian@heritage'  
cultures) ( China,  
Taiwan, Singapore, Hong Kong, Japan and Korea) classrooms, throughout  
the  
primary, secondary and tertiary sectors. (25)

Biggs highlights the paradoxical situation which now exists:

The central paradox is that highly adaptive modes of learning  
emerge from the  
CHC classrooms, and this does need explaining. Large classes, exam  
pressure,  
expository teaching, not to mention teaching in an exotic  
language.....do not sound  
like good news in any system. But these features exist and are  
reliably associated  
with high level outcomes. (26)

However, the situation still remains that while students may engage in  
deep approaches  
to learning they are not deliberately encouraged to do so, nor are they

encouraged  
particularly to apply what they have learnt. Thus it is this  
combination of encouraging  
deep learning and applying what is learned that is of particular  
importance. The point is  
that Kiasuism (fear of losing face), an insular mode of thinking, is  
unlikely to foster  
networking, and convergent responses to questions are unlikely to  
develop good  
decision-making and problem-solving abilities. If new emphases are to  
be established  
consideration has to be given to the nature of teaching-learning and  
assessment strategies  
to be employed as well as the organisation of schools. This is  
consistent with Bigg's  
point that how students approach learning is dependent on the learning  
environment.

## Implications for Teaching and Learning Strategies

Translated into the school context, the challenge is perhaps how to combine the kinds of teaching methods that have produced high standards in the past with new forms of social relationships that would prepare children for work in a global setting. It is acknowledged that already, particularly in Singapore's independent and autonomous schools, a number of innovative teaching-learning practices have been implemented. Cooperative learning strategies and structured group work underpin some of the important skills related to networking and group decision-making which it can be argued are imperatives for successful technological development and global networking. The importance of these methods lies not only in the decision-making processes used but also in terms of cultural understanding. It is clear that a range of specific techniques can be added, such as the development of hypotheticals and debates which give students an exposure to a range of perspectives. The importance of engaging students in group planning exercises, implementing plans and evaluating their outcomes clearly involves the development of skills for future corporate planners and other areas of the workforce. Shuell (1992) has alerted us to the fact that meaningful learning may be accomplished in a number of equally appropriate ways. It is therefore important to implement a diversity of teaching-learning strategies to meet the needs of different learners with different learning styles.

Yip (1993) has drawn attention to the massive increase of information and the need to accommodate the use of appropriate technology. Two implications can be drawn. Firstly it is imperative to make the studying of any subject both conceptually based and applied,

instead of overburdened with unnecessary and obsolete facts. This also means that students will need opportunities to practise accessing, retrieving,

selecting and synthesising relevant information. In this regard, some schools are already using Internet in their learning programmes. Secondly, it is important that subjects include activities that are problem-based so that the acquisition of such skills as interpretation and problem-solving can be applied to different sets of information and situations. Such an approach is consistent with the epistemological underpinnings of the disciplines, the methods of enquiry and the interrelationship of concepts which are peculiar to the discipline. It means that history has to be taught according to the canons of the discipline (Carr, 1961) ensuring that students learn to analyse the context of an event, for example, rather than giving a description of facts. It means that in science opportunities have to be given for students to undertake real investigations rather than follow recipes in a staged-managed heuristic style. The use of case studies, projects, production of newspapers, use of simulation, Internet, multi-media approaches to learning and individual learning contracts are relevant to fostering the required skills. On a cautionary note, more emphasis on 'new' methods should not mean that the conceptual basis of subjects or the vocabulary of subjects should in any way be disbanded, and this to a large extent is dependent on the skills and abilities of teachers and the quality control they exercise.

The use of a greater range of teaching-learning strategies such as those outlined embody new kinds of relationships between teachers and learners. Teachers would become facilitators of learning and students have to take more responsibility for their learning. The right answer syndrome would become less prevalent and students would be more likely to become autonomous and collaborative learners. Teachers would need to teach less and students to learn to think and take opportunities to show initiative. However, it is of no use changing the emphasis in the teaching-learning strategies used in schools if there is no change in the philosophy and practice of assessment.

## Assessment Strategies

These new perceptions of learning and the social relationships implicit in them also have implications for assessment strategies. There is already available a huge range of formats available for assessment, such as portfolios of work, case studies and business

enterprise projects. The important point is that assessment influences the way students learn (Crooks, 1988; Gibbs, 1992; Kings, 1993; Ramsden, 1992). Broadly speaking teachers would need to engage in a greater range of assessment strategies if deep learning is to be encouraged and the development of all the aforementioned qualities are to be fostered. Assessment would need to be broadened to assess objectives that cannot be easily be assessed in the external examination. A further point to mindful of is that if students were to be given the opportunities to assess their own work against given or negotiated criteria they would inevitably be empowered in their own learning. Self-assessment and peer@assessment would facilitate the development of autonomous and collaborative learning.

## School Organisation and Climate

The move towards greater school autonomy provides teachers with a greater role in curriculum decision-making, enabling them to tailor the curriculum in an endeavour to meet local needs. Teachers would need to take more decisions about their teaching-learning strategies and their assessment practices. While the current public examination system is in operation assessment practices will be somewhat limited at certain levels but there is still considerable capacity to diversify practices at other levels and in continuous assessment practices at all levels.

To support the implementation of a greater range of teaching-learning, and assessment strategies Principals and Heads of Department would have to develop a more

collaborative and supportive climate in which teachers would not lose face, in which they could take calculated risks and in which they would feel supported. In such a climate the resources of teachers would be marshalled, the self-esteem of teachers would be enhanced as they would feel a sense of ownership of the curriculum. Teachers would learn from each other in their collaborative endeavours and be more sensitised to the needs of students. Year-long in-service programmes for Principals and Heads of Department are already providing support for these developments. The key concept is to provide an environment in which teachers learn from each other and in which quality control is exercised. A further consideration for the organisation of the school is that structures need to be developed to overcome territorial problems so as to promote some interdisciplinary episodes, effective use of the library, media and resources and total quality management across the spectrum of school activities.

To support the working of the organisation it will be necessary to foster evaluation as an ongoing school-wide activity, owned by schools, to promote the change process (Kings 1994). Evaluation must take place within a realistic framework. As Graham and Kings (1992, 147) have emphasised that, 'In an evaluation model for change.....the goals on which the initial curriculum (defined as all school practices) was based must be able to be changed'. Any evaluation of school practices which is only based on given goals will inevitably not change to any degree and then only within the prescribed framework. As Kings (1993) states: ,

Such an evaluation is not dynamic and will not accommodate to any reasonable extent the significant issues and contingencies which appertain to the changing context of education.

To be effective evaluation processes will have to be built into fabric of the organisation and provide the basis of decision-making and the continuous improvement

of practice.

To support these developments it will be important to consider how schools are to be judged, that is, to consider what type of performance indicators will be emphasised. In the future it will be important to know more about how a school operates than what the pass rates at 'O' and 'A' level are. In other words there will be more concern with such questions as: What are its processes of needs analysis, quality control and staff development in the school? What decisions were made on the basis of evaluation and what were the action plans for implementation of these?

### Conclusion

Singapore represents an interesting case study in the analysis of the current reforms to education systems throughout the world. We have argued that because it was faced with problems of economic and social survival much earlier, and in a more acute form than those more recently encountered by industrialised nations, this provided the impetus for an early radical restructuring of the Singapore education system. This radical restructuring, which laid the basic framework of the system in such key areas as a national curriculum and regular testing of children, was followed by a process of repair which lasted until the mid-1980s. This repair phase involved the implementation of many findings of the effective school researchers and resulted in what is widely agreed to be an effective and highly respected school system. Singapore's experience shows that

there is no one neat chronological sequence between repair and restructuring.

Furthermore, events in Singapore since the recession of the mid-80s suggest that education systems may also go through periods of transition which are characterised by a mixture of repair and reconstruction. We have argued that Singapore is currently in such a period of transition, the impetus for which is once again economic. This period of transition is characterised by the dilemma of how to maintain

educational standards and  
effective schools  
whilst at the same time adapting to the needs of the international  
market place. As with its earlier period of reconstruction, the  
challenges of globalisation  
will be experienced in a more acute form in Singapore than elsewhere,  
simply because  
nothing less than national survival is at stake. The question is  
whether Singapore will  
have an advantage in being able to start with an infrastructure of  
effective schools, while  
other countries, such as the US attempt to interpret and respond to the  
needs of a post™industrial society whilst at the same time having to  
contend with basic problems such as  
school attendance and discipline. As Yip (1993) points out, ' for any  
reform or change to  
succeed, there must first be the political will. Only then will the  
right level of support  
and conducive climate be given to enable schools to implement the  
change'. Given past  
experience, and the recognition that education has always been a  
subject of high politics  
in Singapore, there can be little doubt that that political will is  
there.

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