

## **Innovation and Enterprise in Singapore Schools**

Ng Pak Tee

*Policy and Leadership Studies Academic Group,  
National Institute of Education,  
Nanyang Technological University,  
Singapore*

### Abstract

Schools in Singapore are now tasked to develop the spirit of innovation and enterprise in their students. This is in line with the national vision of 'Thinking Schools, Learning Nation'. This policy initiative, which began in 2004, is set to change the fundamental nature of education in Singapore. This article discusses the innovation and enterprise (I&E) initiative, its major implications for schools in Singapore and the areas still to be addressed in the implementation of the policy. In particular, the article discusses the issues of teachers and school leaders as role models of I&E, I&E as an organic part of school business, the influence of the wider societal culture and values system, and the measurement of success of I&E. The challenge for schools is to go beyond the form of the initiative to bring real substantial and sustainable change through this movement.

Key Words: enterprise, innovation, leadership, policy, school, student, teacher

### Introduction

Singapore has successfully built its economy over the years of independence since 1965. From a struggling little port along the Straits of Malacca, through a series of pragmatic social and economic policies from the ruling government, Singapore was transformed into a world-class cosmopolitan city: a country without natural resources, yet having one of the highest standards of living. However, now the question is how the government, which has played such a dominant role in directing the successful development of key sectors of the economy, is going to position the country to go forward in the 21st century. Increasingly, the survival of nations will depend on how their citizenry can enhance their know-how and market it in the global market (Drucker, 1993; Ng, 2005). Globalisation appears to mandate education as a prime source of economic competitive advantage (Ohmae, 1990) and globalisation can have local effects on schools (Angus, 2004).

As Singapore moves into the 21st century, young people have to be prepared to meet the challenges of tomorrow. The official strategy is called 'Thinking Schools, Learning Nation' (TSLN). Senior Minister Goh Chok Tong, then Prime Minister, introduced this national strategy at the opening of the 7th International Conference on Thinking. In his speech, Mr Goh (1997) said:

Singapore's vision for meeting this challenge for the future is encapsulated in four words: Thinking Schools, Learning Nation. It is a vision for a total learning environment, including students, teachers, parents, workers, companies, community organisations and the government.

He looked to the US as a good example of people who were able to produce highly creative and entrepreneurial individuals.

Their best schools produced well-rounded, innovative students by putting them through a diverse and challenging curriculum. Their academic institution and research laboratories are at the forefront of ideas and scientific breakthroughs, infused with entrepreneurial spirit. And they have developed strong links between academia and industry, society and government. We in Singapore should learn from these strengths of the American system.

TSLN, implemented since 1997, is a key strategy for Singapore to remain competitive in the international economic arena for the next generation. Many initiatives were launched to address the various facets of TSLN, including more autonomy to the schools and an ability-driven education paradigm. Now, the focus has shifted to 'Innovation and Enterprise' (I&E). According to the Ministry of Education (MOE), I&E is not new in the system. Education Minister, Tharman Shanmugaratnam (2004a) said:

But we need to give (I&E) more emphasis, and more focus. It is part and parcel of what we all know as Thinking Schools, Learning Nation. It is not a new programme; it doesn't replace existing programmes. It is the way we will take Thinking Schools, Learning Nation forward in the new era.

The government's theory is that Singapore needs people with a strong I&E spirit to meet the challenges of global economic development and to hold their own in the face of fierce international competition. Singapore needs people who are willing to try new, untested routes, without undue fear of failure. Singaporeans need to create and seize new opportunities instead of just improving the efficiency of conventional businesses. This is essential for Singapore's development and indeed survival (Tharman, 2004a).

While the introduction of the I&E policy is important and timely to support TSLN, it is a policy change that will deeply affect the fundamental nature of education in Singapore. This article discusses the I&E policy and reflects on the implications and challenges of I&E for schools in Singapore.

### The Motivation for the I&E Policy

Like many other education policies in Singapore, the I&E initiative was launched because of a pragmatic consideration for the future of the nation in the international economic arena. Said Minister Tharman, (2004a) of the rationale for I&E:

(We need to address) what is it that is new that we need to prepare our young for, in the future. The most obvious change is that it is now a much more interconnected world than it has ever been. And the pace of these interconnections has also increased. China and India alone, are recasting the global economic landscape in fundamental ways... it's not just about low cost. It's not just the fact that places like China and India are much cheaper than the developed world, or cities like us. It's also the fact that they are concentrating their best and most energetic talents in the key cities...

Not every society and city will come out ahead in this. But the societies that come out ahead will be those that look forward, and look for ways of creating opportunities, new opportunities, for their populations – in other words, the societies and cities that respond to this new competition – this competition of new players coming up the value curve, by themselves moving further up the value curve, or creating new curves for value creation.

Already, there have been signs that the country is going in this direction. There was a steady rise in the number of patents by Singaporeans and Singapore-based organisations in the last decade. Patent applications in Singapore rose over four times to nearly 8,000 filed in 2003, up sharply from 1,818 in 1994. Moreover, research institutes have also stepped up their gear. For example, the National University of Singapore filed 132 patents locally and internationally in 2003 compared to 10 in 1993, as it moves from being a teaching to a research-intensive institution (Chang, 2004).

### What is Innovation and Enterprise (I&E)?

The term 'Innovation and Enterprise' may conjure the image of commercial businesses and entrepreneurs. However, the MOE is clear that I&E is not centred around creating entrepreneurs or letting them run businesses. Said Minister Tharman (2004a):

(Entrepreneurship) is not something you can go about proactively developing and systematising, and hoping that you get a certain output... there are certain activities, of course, we want to expose our children to. Give them a chance to, sort of, develop products, sell a few things, create market places. There is no harm in that. But that activity is not at the core of what we mean by innovation and enterprise.

What then is Innovation and Enterprise? Tharman (2004a) clarified:

Innovation and enterprise is an attitude of mind, developing habits of mind. At the core of it, innovation and enterprise is firstly, about developing intellectual curiosity amongst all

our children, a willingness to think originally. Second: a spirit of initiative, and a willingness to do something differently, even if there is risk of failure. And third, it's about developing strength of character. The ability to bounce back, try again, and the willingness to stand in a team – to lead a team, and to fight as a team. So these attitudes, put together, are what we are trying to achieve in education as we go forward. They are intangible factors, but these intangibles ultimately will be what remakes Singapore, and allows Singapore to stay relevant.

Therefore, teachers and students with a strong spirit of I&E possess a mindset and outlook of creativity, initiative and self-reliance. They possess the following core attributes:

- Intellectual curiosity (e.g. to question assumptions, explore and experiment) and ability to see things in new ways (e.g. to recognise patterns and make connections).
- Passion, strength of character, persistence, resilience and ruggedness.
- Courage to live with ambiguity (e.g. to seek alternative pathways) and to take calculated risks.
- Sense of teamwork and 'giving back' to the community.
- Grounded in a set of time-honoured values that serve as guiding principles to navigate choices in life, e.g. integrity, social responsibility and respect for others.

I&E is still in its infancy within the Singapore education system. Schools are still scrambling to understand how they can implement this policy. But its introduction has a few major implications to schools in Singapore. There are also teething issues to be addressed and refinements to be made, both in policy and in practice. The article now describes some implications and challenges of I&E for the Singapore school.

#### Teachers as Role Models of I&E

Teachers are role models for students in their learning. Therefore, the teachers play a critical role in promoting the spirit of I&E among students. They need to model the right attitude and qualities, so that their students will be inspired to be bold and to be unafraid of mistakes as they search for answers and solutions. Are teachers able to do so? More importantly, what does a teacher with strong I&E spirit look like? These are important questions to be answered.

One acute task in the education system is to promote constant innovation and experimentation in teaching itself. Teaching needs to be an exercise in creativity to discover new ways to spark off questioning in the classroom, or to excite students to explore or think through issues for themselves. But this may go against the general culture of wanting 'orderliness' within the classroom, where students take copious notes from the

teacher or get copies of prescribed answers to memorise for the examinations. This is unlikely to groom a generation of young Singaporeans who can think on the move and seize opportunities. If students are encouraged to be risk-takers, teachers must be risk-takers too (Hargreaves, 2003). But teachers' beliefs are influenced by their experiences as learners (Grant, 1996). This generation of teachers has been educated and trained through a system with beliefs markedly different from those now espoused. Teachers are therefore caught in a dilemma between the push for innovation and the pull of the familiar (Tharman, 2004b). Teo, Tan and Lee (2004) acknowledged this:

We have to provide space for our teachers themselves. Space for them to be able to reflect, think of new ways of teaching, to collaborate with their peers and find new ways of sparking off this culture of enquiry that we want amongst our pupils.

In this aspect, one of the programmes the MOE has introduced in 2003 to spur the teachers on and give them exposure to experiences outside the school is the Teacher Work Attachment Programme. The idea is to give those who participate in the attachment the opportunity to learn about new work environments in the commercial world, thus leaving their 'comfort zones' and plunging into unfamiliar environments. The aim is to give teachers first-hand experience of the flexibility and adaptability that their students will need in the changing workplace. The stints can vary from a week to several months and teachers can also get to work overseas with foreign schools and companies.

However, research has suggested that professional development is usually most effective when it is embedded in the school and when it is the focus of collaborative discussion and action (Little, 1993). Therefore, more importantly, there must be a collaborative staff development mechanism within schools so that the experiences gained by individuals through work attachment can be shared and translated into effective school-wide change in programmes and pedagogies. The effectiveness of the Teacher Work Attachment Programme in changing the mindset of teachers, thus facilitating the process of I&E implementation in schools, remains to be seen.

#### School Leaders as Role Models of I&E

While teachers have to be role models of I&E for students, school leaders have to be role models of I&E for both teachers and students. Schools will have to break away from the old model of merely receiving and executing edicts from headquarters. Schools will have to be innovative and enterprising spearheading their own education or reform initiatives within the broad policy parameters defined by the MOE.

While the MOE has made clear that schools should look out for ‘signposts’ and not ‘performance indicators’ for innovation and enterprise, some school leaders may still interpret the initiative as one that demands visible performance, which can affect their careers, hence the need to ‘show something’ and do so quickly. But I&E is a long journey and may take a few years to bear fruit. Therefore, without the true spirit of I&E, there will more and more projects undertaken throughout the school system, all in the name of I&E, but merely out to satisfy the requirement of the policy or prove the worth of the school. I&E is not another field for inter-school competition. In order that I&E is meaningful, school leaders and teachers should focus on the spirit of I&E and not just the evidence of I&E. Otherwise, I&E may end up as form without substance.

Therefore, headquarters officials and school leaders have to plough the ground conscientiously but hold back the desire to see quick results. While Singapore schools generally have a rigorous curriculum, a comprehensive range of co-curricular activities and quality teachers, in nurturing the spirit of I&E in their students, schools need to balance their efforts across the different domains of all-round development to best deliver holistic education. It will take some time before schools can find their respective optimal states of equilibrium to achieve good academic results and a strong I&E culture that espouses all-round education. It is also possible that some schools may oscillate for a prolong period of time without finding an optimal state.

In theory, I&E needs a culture of risk-taking and experimentation, rather than risk-avoidance and rule compliance. However, there is tension because such a new mindset has not completely replaced the old one. The Singapore brand of leadership has been described as ‘too data-driven, too cautious, too little gut feel, fairly risk-averse’ (Long, 2004). Thus, one other acute issue about school leadership is that while the policy is already in place, leadership in I&E demands human qualities that are not found in abundance, whether in the education, industrial or commercial sector. But if I&E is to happen, the school leaders must be role models of I&E. Only then will staff members of the school believe in the initiative and be galvanised into action. If there is incongruence of word and deed, cynicism will set in and teachers will believe that I&E is yet another fad, an exercise to satisfy the headquarters or to pursue awards. Are school leaders mentally prepared and adequately trained for their role in I&E in practice? Are they prepared to take risks themselves?

In this area, some progress has been made in leadership preparation. Instead of imparting administrative skills, the new focus is the inculcation of an innovative mindset. At the National Institute of Education (NIE), which is the only teacher and school leader training institute in Singapore, the Leaders in Education Programme (LEP), which started in 2001, aims

to develop programme participants into innovative school leaders. The LEP is a 6-month full time programme for specially selected vice-principals and MOE officers to prepare them for school leadership with the capability to transform schools into innovative learning communities. Such schools are incubators that nurture innovative students and teachers in a rapidly changing and complex economy, one that is driven essentially by knowledge and learning and pays a premium for innovation and enterprise. The NIE is undertaking a longitudinal research to examine the long-term effectiveness of such a programme.

### I&E as an Organic Part of School Business

Perhaps one of the greatest difficulties in persuading teachers of the benefits of I&E is the lack of evidence that shows a link between I&E and academic results. Investing in I&E that may affect examination performance over time seems either irrelevant or a luxury to many schools that are struggling to get results in the national examinations. Therefore, while the better schools can afford to 'indulge' in I&E, the weaker ones could ill afford to divert their attention from the 'bread and butter' issues of examination results. Is it appropriate for a poorly performing school to emphasise I&E? Can a school really inspire its staff and students by so doing? Could it be de-motivating rather than inspiring for the teachers? Would a 'back to basics' message have been easier to motivate the struggling teachers to go back to their first love for the students and teaching and seek improvement from there?

Therefore, the danger here is that there may be 'peripheral' innovation in schools to satisfy the letter of the law but hardly any substantial curricula innovation especially in the examinable areas. Success can sometimes be the worst enemy of progress and reform. Why change a strategy when it brings so much examination success? The national curricula requirements and the pressures of national examinations pose a challenge to school leaders to innovate in their 'core businesses'. Principals cannot afford to stray too far, so long as they are held accountable for their schools' performance in the national examinations (Porter, 1990). On this front, Porter (1990, p. 40) asked:

Amid this climate of risk-averse behaviour, what then are the prospects of wide-ranging and sustained change, as far as the teaching of critical and creative thinking skills, the incorporation of information technology into teaching and learning, and the promotion of project work as a form of assessment?

The issue is not whether these initiatives are implemented. The challenge is whether the initiatives delve deep beyond the surface level to change

the basic philosophy and approach to education. The result remains to be seen.

A related issue is therefore whether a student who strives for an I&E spirit and holistic education can perform well academically. In theory, the pursuit of I&E and holistic education is not inconsistent with high academic standards. Students with a strong I&E spirit have the intellectual curiosity and strength of character to pursue their studies with perseverance and rigour. Such students should continue to perform well academically. But equally, it is possible to have a student who can run a successful co-op in school but fail in science and language. Would this student be recognised as a success or a failure in school? Where is the balance point between 'I&E pursuits' and preparing for academic examinations?

Therefore, how schools integrate I&E into their everyday business is an area of concern. There is a danger that some school leaders and staff may view I&E as an add-on initiative. Instead of getting everyone in the school involved in I&E, certain members of the school may be tasked to tackle the requirements of the policy. Instead of innovation in the classrooms that brings direct benefits to students, there may be stand-alone projects that have peripheral impact on student learning. But if schools in Singapore are to develop students for a competitive future, I&E cannot be seen as yet another project for only certain groups of people.

There is also a concern that this new initiative will add to the workload of the teachers. Schools will have to design I&E programmes fairly quickly to allow students to be involved in I&E meaningfully. Many schools will have to implement I&E in the midst of many other initiatives. There is a danger that after identifying a long list of 'I&E projects', schools will embark on all these, biting off more than they can chew, driven by a desire to showcase some I&E success. However, if schools and teachers could take the opportunity to examine their approach to educating students, to give priority to the programmes and activities which support the focus on I&E and holistic education, and to rationalise activities or practices which may be less relevant, there are good grounds to think that I&E will not add to the teaching load. It just means a different load, but not necessarily heavier. The challenge is for school leaders to 'slow down' to reflect on what they are doing, instead of giving in to the tendency to rush into action.

School leaders are thus very important. They will have to give the direction and find the balance. Teo, Tan and Lee (2004) said:

School leadership requires a thoughtful balancing of priorities. There will be many new ideas and plans that you will want to implement, especially when each of these is beneficial to your pupils. And in an environment where new ideas are always encouraged, there will be no shortage of ideas and suggestions from within the school, from the community and even from the Ministry. But it will not be possible, and indeed not desirable either, to try and run with all these ideas and suggestions at the same time... A sensible balance of activities



is therefore necessary, to ensure that we deliver real value in the school, do not overstrain our teachers, and do not have shallow outcomes amongst students.

The challenge for school leaders is to chart the direction and craft the strategy amidst intense inter-school competition and fast pace change. This is not unlike changing the tyre while the car is still running.

### The Wider Societal Culture

The education system is not an isolated system. It is an open one that is deeply influenced by the wider societal culture and vice versa. The push for I&E in schools will have to take into account the factor of societal culture and the challenges that brings. Two challenges to be addressed illustrate this point.

One of the challenges is the notion of success. For a long time, a successful student has been one with good academic results. Brilliant youths are those who take 4 'A' level subjects and 2 'S' papers and score distinctions in all of them (Ng, 2003). Is the society ready to embrace a broader notion of success? What is 'success' in an I&E paradigm?

While there is yet a clear definition of what 'a broader notion of success' is, the MOE has gone some way to send signals about a mindset change regarding the notion of success. A newspaper carried this report when the national examination results were released (Ng and Davie, 2004):

The Education Ministry has departed from its usual practice of releasing the list of schools which had 100 per cent of their students scoring five or more O-level passes. Nor is it telling which schools showed significant improvement in percentage passes. It is doing so, its spokesman said, because it wants to make the point that success in education should not be measured by academic results alone. Instead, it wants to focus on 'system-wide achievements' which are impressive.

The MOE has also decided to adopt a more flexible and differentiated approach to school and university admissions. From a centrally controlled admission system, schools are given more leeway in admitting their own students (Davie, 2004) and the universities will take steps towards greater ownership of their admission criteria, leading eventually to full autonomy in admissions (Ministry of Education, 2004). The government's reasoning is that the increased flexibility will enable the schools and universities to be more responsive to their strategic objectives and changes in market demand, as well as to compete for the best students. It will also signal a shift away from a fixed formula of success.

Another challenge to I&E is that Singaporeans are still generally conservative when it comes to trying untested routes. This may be partly, if not mostly, due to a culture that frowns upon failure. But I&E involves

experiment and risk. Failure is a faithful friend before success arrives. One manifestation of this aversion to risk-taking is the observation that Singaporeans tend to keep out of trouble, in particular about speaking against official lines (Ng, 2003). *Straits Times* journalist Koh Buck Song wrote (Koh, 1994):

...Singaporean youngsters hesitate to stick their necks out, unless there is support from a group. The way they see it, if there is a petition going around, let mine be one of the last signatures... (but) students here can hardly be blamed for their lack of initiative, if adults themselves are not anymore forthcoming, because they have seen one or two suffer in the past. So, those who wish to see more public-spiritedness among the young should first examine themselves, to see if how they live their lives and conduct their affairs has contributed, in any way, to the prevailing 'play- it-safe' culture.

Another *Straits Times* journalist Chua Mui Hoong wrote about the 1994 Pre-University Seminar, where some of the brightest 17–18 years old students from different junior colleges met to discuss national issues (Chua, 1994):

But this year's students, as students did in previous years, blamed the 'system' for their apathy – the education system, the Government, the schools, their parents and society at large. 'You want balanced individuals, change the education system to help us become balanced individuals,' said one student...

The comments showed these youngsters up as passive grippers who would rather blame everything around them for their apathy, than to seize the challenge to chart their future...

It is ironic that the youngsters who wanted the vote at 18 were the same ones whose response to every challenge to chart their own future was to ask: 'What is the Government doing to help me?' Students are counting on the Government as an all-round problem solver.

That was some 10 years ago. Today the problem is still there. Ex-Prime Minister Goh Chok Tong is worried that the young are apathetic about national affairs and worry only about their career and comfort (Low, 2004a). People are still not speaking up, questioning where the 'out-of-bounds' (OB) markers are. Current Prime Minister Lee Hsien Loong acknowledged the issue but felt that Singapore has made significant progress in this area (Lee, 2004):

When Dr Catherine Lim published a highly critical commentary on ministers' salaries in 1994, the Prime Minister's Press Secretary responded sharply. Dr Lim then clarified that she had never intended to question the Prime Minister's fitness to govern the country. A boundary had been probed, and an out-of-bounds (OB) marker firmly planted. On the other hand, after September 11, we were able to discuss openly and maturely gut issues of race and religion, and how we could build trust between Muslims and non-Muslims. These sensitive matters were not off-limits to rational discussion after all.

However, he had no doubts that Singapore had to open up further (Lee, 2004):

I have no doubt that our society must open up further. The growing participation and diversity over the last two decades have been vital pluses for Singapore, enabling us to adapt to changing conditions, and to the needs and expectations of a new generation. They are the key to providing Singaporeans an emotional anchor.

There are some signs that the society has indeed opened up somewhat. These hopefully will have a mutually reinforcing effect on I&E. In an almost unprecedented move, senior career civil servant Ngiam Tong Dow questioned the assumption behind a number of key government policies such as housing and taxes in a hard-hitting speech to the Economics Society of Singapore (Tan, 2003). In a new television programme called 'i-contact' on channel i, various ministers fielded questions from some thirty eager students from secondary schools and junior colleges. In one of the episodes, Education Minister Tharman Shanmugaratnam was in the hot seat, fielding questions and engaging students in a frank debate. He commented that the students 'were quite unconstrained. They weren't holding back, but their questions were sensible ones.' He also found it encouraging that students questioned the way schools were being run. 'They are thinking hard about what's good, about what makes sense in schools. They're questioning what is done, and I think that's good.' One student participant of the programme remarked that 'I'm quite happy with the minister's answers. They weren't just evasive. He spoke his mind, just as we did, and I think that was good for the programme and for all of us.' (Low, 2004b)

#### Navigating the Margins of Rules and Values

A critical concern about I&E is that as schools in Singapore engage in I&E, the staff and students will find themselves operating close to the margin of rules and values. There is always a chance they may step over the boundaries. The OB markers are not clearly and comprehensively defined at this moment. If a primary school child earns a profit from his classmates in photocopying something for them, is this an enterprise to be cheered or is this something to be frowned upon, flying in the face of 'good friends should just help one another'? If a student from a poor family decides to sell merchandise in school, reaping a profit, should the teachers allow or disallow such a venture? Are school leaders and teachers ready to make such a call? Does the school have a common stand on such issues? Are the parents aligned with the stand of the school? Are school leaders and teachers ready to handle the challenge of various 'camps' of parents, each with differing value systems?

Enterprising students will be doing some things in the grey areas of ethics at one point in time or another and they may rely on their 'street-smart' senses to avoid discovery by their schools. Will this promote a mentality of 'you can do anything so long as you do not get caught'? Will the teachers, upon discovery of such ventures, use it as a learning opportunity for values inculcation?

There is hardly a clear-cut answer to all possible situations. Stop and reprimand the child and the spirit of innovation and enterprise may be lost. But do teachers have the aptitude and are they equipped with the subtle skills to turn such incidents into learning opportunities? This remains to be seen. Therefore, the values system is the key. Singapore needs innovative and enterprising Singaporeans, but not sly businessmen. As schools push for I&E, the strength of the values system will be put to the test. Therefore, the more the schools emphasise I&E, the more the schools should emphasise values education, which has not been given enough emphasis.

#### Measurement of Success of I&E

The 'measurement' of the success of I&E is a tricky issue. While it is important for the MOE and schools to gain a sense of progress over time, the problem is that it is difficult to measure I&E quantitatively. MOE has indicated that this can be done through qualitative evidences such as anecdotes and interviews from schools. Schools could look for a set of 'I&E signposts', that serve as a guide for schools in their development, so they can gauge their general state of progress along their I&E journey and give an indication that the school is on track.

While the MOE has stressed that schools should look out for 'signposts' instead of 'performance indicators', it will take some time before 'reasonable' and 'meaningful' signposts are established. It will also take some time before school leaders and teachers build up the skills of a qualitative approach to measurement to complement the more practised quantitative approach. The challenge is to avoid turning 'signposts' into 'performance indicators' again.

One important issue is therefore to have an understanding of what an innovative and enterprising school is. According to Ng (2004), an innovative organisation can be understood as one in which members of the organisation are systemically (integrated, seamless and coherent) and systematically (with order and method) renewing the organisation through innovation as part of their everyday existence. In the same spirit, an innovative and enterprising school is one in which the staff and students of the school are systemically (integrated, seamless and coherent throughout the programmes and operation of the school) and systematically (with

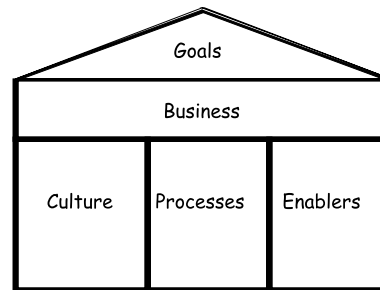


Figure 1. The Organisational Change Model.

order and method) learning and practising innovation and enterprise as an integral part of their everyday learning experience. Metaphorically, such a school has an engine of deep learning, knowledge sharing and innovative practice, which fuels the development and renewal of the school and its staff and students (Ng, 2005). Echoing Hamel's (2000) reference to an innovative organisation, I&E is a deep capability or core competency in such a school.

To develop signposts for an I&E school, the organisational change model (Ng, 2001) (Figure 1) provides a framework for schools and officials to systemically and systematically reflect upon their I&E journey. It says that in a large-scale organisational change, leaders and managers should consider the goals, business, culture, processes, and enablers (tools and resources) seamlessly and coherently in order that the change could be anchored in the organisation to bring real sustainable benefits. This model advocates change agents to think the issue through carefully from the angles of goals, business, culture, processes and enablers, making sure that these factors have been seamlessly and coherently addressed before plunging into a large scale change.

Based on the organisation change model, school leaders and teachers could reflect on (Ng, 2005):

- *Goals*: Does the school have a clear articulation of the goals of I&E and how these support the achievement of the larger goals of the entire school? Are these goals shared by all members of the school?
- *Business*: How do the proposed programmes of innovation support the espoused goals of the school? Is I&E an integral part of the school's business?
- *Culture*: Is the school culture conducive to bring about I&E? When the predominant culture is one where people believe in the merits of change and renewal, it stimulates innovation. However, if it is based on a belief in earlier formulations for success and people are resistant to change, I&E is hindered. Is there a mindset issue among staff and students

toward I&E (e.g. fear of change, cynicism)? At the end of the day, for I&E to be successful, it has to become a way of life in school.

- *Processes*: Processes refer to the workflow of the school in fulfilling its business. The key question to ask is whether there are effective and efficient streamlined processes for staff and students to come together to generate ideas, identify potential winners, experiment and bring ideas to fruit? Or are the associated processes so cumbersome (e.g. approval, checks and balances) as to put people off?
- *Enablers*: Enablers are the resources and tools that support the business. People cannot innovate effectively and efficiently unless they have resources and good tools to work with. Questions that leaders have to ask include:
  - Do staff and students have the requisite training in skills such as creative thinking?
  - Do staff and students have the financial support for experimentation and implementation?
  - Is time factored into the timetable for staff and students to brainstorm ideas and experiment?
- *Overall*: Have the goals, business, culture, processes and enablers been seamlessly and coherently addressed in pursuit of I&E?

These questions are of course not exhaustive. Reflecting on these questions give leaders a sense of the direction the I&E effort in the school is heading and the extent of its pervasiveness. It also helps school leaders develop a clear vision and viable strategy for school-wide implementation of I&E so that I&E efforts will not become sporadic and aimless. While it is possible to develop taxonomy from the above model to gauge the level of progress, it is through the constant reflection on key questions that will keep a school on track in I&E. But, it is hopeful that the introduction of the policy will drive the development of educational processes and its associated measures in this area.

### Conclusion

Many educational systems have failed in their large-scale centralised reform attempts in affecting the actual learning of students (Fullan, 2000). Will Singapore prove otherwise in its I&E initiative? It will take some years before one can tell. But intuitively, such a policy has set a platform that will influence national culture and economic competitiveness. A longitudinal research to examine the impact of this policy on social culture and economic reality in Singapore will be valuable. The information

generated through the research will provide both policy makers and researchers a better understanding of how a policy change in the education system could lead to a fundamental change in the entire society.

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