Leadership for change in Singapore schools: An introduction

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Chapter 1

Leadership for Change in Singapore Schools: An Introduction

Thiam-Seng Koh and David Wei-Loong Hung

As the first chapter of this book, we share some background information about Singapore and Singaporean education to provide the necessary context to understand the subsequent chapters in this book. We also share the kind of education that we think that Singapore should provide for its citizens to meet the challenges ahead and an overview of the role played by educational leadership in Singapore to bring about the required changes that led to the educational innovations described in the subsequent chapters. We hope that readers who are not familiar with Singapore will find a good overview of Singapore and Singaporean education in this chapter. However, for readers who are already familiar with Singapore, we recommend that they should skip these two sections and proceed to the section on “Preparing for the Future”. In this book, we share about how to prepare learners for the future and will focus on the role played by school leadership in preparing these learners for the desired future.

INTRODUCTION

As authors of this chapter, we belong to the generation of baby boomers in Singapore. We started our lives in Singapore in a much simpler time. We grew up at the time when the Singapore economy was at its nascent infancy. But, we are fortunate to be part of the economic growth journey where Singapore transformed itself from a third-world economy to a
first-world economy in a relatively short span of less than 50 years since independence.

In our lives, we have experiences of sanitation in our homes that had gone from primitive to modern sanitation. We went from no television to black-and-white television and to the 4K colour smart television today. We went from no telephone in a home to almost everyone having a personal mobile phone with some carrying more than one mobile phone. When we were growing up, many of our peers were still living in *attap* (constructed from palm leaves) houses and in *kampungs* (or villages). Living standards have improved by leaps and bounds since then in tandem with our economic progress. Today, more than 80% of our Singapore population live in modern public housing that provide modern sanitation, electricity, fibre-based internet connectivity within pleasantly designed and thoughtfully planned communities with recreational facilities. About 90% of the people living in public housing proudly own their homes (HDB, 2017). Singaporeans on the whole enjoy a high standard of living. Singapore is ranked sixth on the 2013 where-to-be-born index by the Economist Intelligence Unit (2013). Despite complaints from citizens to the contrary, we are served by first class road networks and public transport. Our Changi airport is our quick gateway to the rest of the world.

**Singapore’s Economic History (1965–2015)**

To appreciate how Singapore became the economic miracle that it is today, we summarise below Singapore’s economic history as shared by Mr Ravi Menon (2015), Managing Director of the Monetary Authority of Singapore. In 1965, when Singapore first became independent, our Gross Domestic Product (GDP) per capita was about US$500. In 2015, our GDP per capita grew to US$56,000 which placed us at the same level as Germany and the United States of America. This is a remarkable jump in GDP per capita of more than 110 times over a period of about 50 years. In 1965, Singapore defied the conventional economic wisdom to pursue an export-led industrialisation instead of import-substitution strategy through attracting successful global multinationals into Singapore to fuel
the country’s economic growth. From 1965 to 1984, through the use of the latter strategy, we enjoyed economic success with the Singapore economy growing at an annual average of about 10%. In 1985, Singapore faced a recession arising from structural issues in the economy. Singapore began to face resource constraints and diminishing returns on investments and the narrowing of cost advantage enjoyed previously as our economy “matured”. With the recession, Singapore did a fundamental review of its policies and strategies and embarked on a twin engine of growth based on manufacturing and modern services such as finance, business, info-communications and entertainment. By 2010, Singapore made the transition from a third-world economy to a first-world economy where Singapore became “an affluent society and a global city, at the cross-roads of international flows of trade, investment, finance and talent”.

Singapore’s Size and Population

As of 2016, Singapore is a small island nation situated at the tip of the Malay Peninsula that is about 720 square kilometres (Government Technology Agency of Singapore, 2017). To give a sense of size, Singapore’s longest expressway is the Pan-Island Expressway or PIE that runs from the east to west and is only about 43 kilometres long. If we were to drive at an average speed of 60 km per hour, we will be able to drive across the island in about 45 minutes. To give a sense of how small Singapore is, the then Indonesian President, Bacharuddin Jusuf Habibie in 1998, referred to Singapore as just a “red dot” in the world map. As of 2016, we have a population of about 5.6 million people (Department of Statistics, 2016a). The Singapore residents comprising citizens and permanent residents constitute about 3.9 million. The remaining 1.7 million are non-residents from many countries who have found work in Singapore. As of June 2016, our ethnic composition of the resident population comprises about 74% Chinese, 13% Malay and 9% Indian (Department of Statistics, 2016b).
SINGAPORE EDUCATION

Our Singapore Government sees education as one of the key strategies for nation building and for economic growth (Gopinathan, 2015). In nation building, education is key to nurturing a harmonious multiracial and multi-religious society where our citizens are global citizens but rooted in Singapore. To achieve economic progress, education is a means of developing the full potential of its citizens where they are able to make meaningful and active contribution to the economy. Singapore is constantly pursuing educational innovations to achieve the latter goals. For the financial year of 2017, the Singapore Government has set aside an operating budget of about $56.3 billion (Ministry of Finance, 2017). Of this operating budget, the Education Ministry is allocated an operating budget of about $12.1 billion (or 21.5%) which is only second to the Defence Ministry’s operating budget of $13.6 billion (or 24.2%).

Singapore Education System

For the key statistics on the Singapore education system, we drew on the information from the Education Statistics Digest 2016 published by MOE (MOE, 2016). The education system comprises 366 schools. We have 182 primary (elementary) schools, 154 secondary (middle) schools and 14 junior colleges (high schools). The remaining 16 schools are mixed level schools i.e. either primary to secondary (Grades 1–10/11) or secondary to junior college (Grades 7–12). The total enrolment from Grades 1–12 is about 455,000. The number of school leaders and teachers is about 34,000. The number of para-educators providing support is about 7,800. The average students-to-teacher ratios at primary, secondary and junior colleges are 15.9, 12.4 and 9.5 respectively (these ratios exclude the Principals and Vice-Principals). The average class sizes in primary, secondary and junior colleges are 33, 34 and 22 respectively.

In the publicly funded education system, students start primary school at the age of 7 years old. All students go through 6 years of primary education (from Grades 1–6). At the end of their 6th year in primary
education, they will sit for the Primary School Leaving Examination (PSLE). Based on their PSLE results, they can then be admitted into a secondary school course.

The top 10% of the PSLE cohort will be eligible to apply to do the Integrated Programme (IP) which is a 6-year programme leading to either the Singapore General Certificate of Education (GCE) (Advanced) or the International Baccalaureate Diploma examination. As the IP students are in the top 10% of the cohort and are university bound, they will skip sitting for the Singapore GCE (Ordinary) examination after 4-years of secondary education and will through-train into the 2-year junior college course. Students who performed in the bottom 15% or so of the cohort for the PSLE will do a 4-years Normal (Technical) course that leads to the Singapore GCE (Normal-Technical) examination; after which they can articulate into the Institute of Technical Education. The next 25% or so of the students will do the Normal (Academic) course. After 4 years of secondary education, these latter students will sit for the Singapore GCE (Normal) examination. The academically stronger students will do an additional year of secondary education and will sit for the Singapore GCE (Ordinary) examination. The academically weaker students will either go on to the Institute of Technical Education or to a Polytechnic. The remaining students will do an Express course and will sit for the Singapore GCE (Ordinary) examination.

Based on their results, some will go on to do a 2/3-years junior college course leading to the Singapore GCE (Advanced) examination or a 3-year polytechnic course. Students who do well for their Singapore GCE (Advanced) examinations or the International Baccalaureate Diploma examinations will generally go on to do their university programmes in one of the local or overseas universities.

The Singapore education system from Grades 7–12 is a system of “bridges” and “ladders”. It is possible for students who start in an academically weaker course such as the Normal (Academic) course and performs well academically to move on to the Express course or from the Institute of Technical Education to a polytechnic and eventually to a
university. The strength of the Singapore education system is the multiple and diverse pathways from academic to technical (or vocational) that the students can take according to his academic abilities to get a good education to prepare them for the workplace and for life.

Mission and Vision of Singapore Education

As an island nation where people are its main natural resource, the Singapore Government naturally invests significantly in education. Based on the Singapore Ministry of Education (MOE) website, the mission of MOE is “to mould the future of the nation by moulding the people who will determine the future of the nation”. MOE aims to “provide our children with a balanced and well-rounded education, develop them to their full potential, and nurture them into good citizens, conscious of their responsibilities to family, community and country” (MOE, 2017a).

The vision that drives the work of MOE is “Thinking Schools, Learning Nation” (MOE, 2017a). In 1997, the then Prime Minister, Chok-Tong Goh, shared this vision as part of his speech at the opening of the 7th International Conference on Thinking hosted by Singapore. This vision is a rally call to provide an education for a thinking and committed citizenry that will be capable of meeting the challenges in the 21st century. In terms of the implementation, this vision encourages the nurturing and sustaining of a culture in schools that promotes critical thinking, creativity, innovation, lifelong learning and embracing change.

Desired Outcomes of Education and 21st Century Competencies

MOE has unpacked the mission and vision by articulating the desired outcomes of education and the 21st century competencies expected of the students who “graduate” from the Singapore system.
MOE (2017b) summarises the desired outcomes of education as follows:

“He has a good sense of self-awareness, a sound moral compass, and the necessary skills and knowledge to take on challenges of the future. He is responsible to his family, community and nation. He appreciates the beauty of the world around him, possesses a healthy mind and body, and has a zest for life. In sum, he is

- a **confident person** who has a strong sense of right and wrong, is adaptable and resilient, knows himself, is discerning in judgment, thinks independently and critically, and communicates effectively;

- a **self-directed learner** who takes responsibility for his own learning, who questions, reflects and perseveres in the pursuit of learning;

- an **active contributor** who is able to work effectively in teams, exercises initiative, takes calculated risks, is innovative and strives for excellence; and,

- a **concerned citizen** who is rooted to Singapore, has a strong civic consciousness, is informed, and takes an active role in bettering the lives of others around him.”

Based on the desired outcomes of education, the Ministry of Education (2017c) summarises the 21st century competencies required to live and work successfully in a fast changing and digital world in Figure 1 below.

**MOE Policies and Initiatives**

Since 1997, in achieving the desired outcomes of education, MOE embarked on a range of policies and initiatives to encourage and support educational innovations in the schools. Tan, Koh and Hung (2017) summarised the MOE policies and initiatives in Table 1 below.
Table 1: MOE Policies and Initiatives from 1997–2015

<table>
<thead>
<tr>
<th>Year</th>
<th>Policy / Initiative</th>
<th>Brief Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>Thinking Schools, Learning Nation (TSLN)</td>
<td>Launched by then-Prime Minister Chok-Tong Goh, TSLN was a vision to prepare students to meet the challenges of the future (Goh, 1997).</td>
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<tr>
<td>1997</td>
<td>First Masterplan for ICT in Education (Masterplan 1)</td>
<td>Masterplan 1 was launched by Chee-Hean Teo, then-Minister for Education. It aimed to equip each school with hardware, software and network connectivity for students and teachers to access resources. It also targeted that 30% of students’ curriculum time would use computers (Teo, 1997).</td>
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<tr>
<td>Year</td>
<td>Policy / Initiative</td>
<td>Brief Description</td>
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<tr>
<td>1997</td>
<td>National Education Curriculum</td>
<td>Launched by then-Deputy Prime Minister Hsien-Loong Lee to develop national cohesion by instilling shared core values, the will to prevail, and ensure Singapore’s continued success and well-being (Lee, 1997).</td>
</tr>
<tr>
<td>2003</td>
<td>Second Masterplan for ICT in Education</td>
<td>This built on Masterplan 1 and aimed for the effective and pervasive use of ICT in schools by integrating ICT into the curriculum, establishing baseline ICT standards, and seeding innovative use of ICT among schools (Koh, 2008).</td>
</tr>
<tr>
<td>2004</td>
<td>Integrated Programme</td>
<td>Provided some students with broader learning experiences through a seamless 6-year programme starting in Grade 7 (Secondary 1) that culminates in a Grade 12 (Pre-Tertiary 2) examination, without having to sit for a Grade 10 (Secondary 4) GCE O-levels national examination.</td>
</tr>
<tr>
<td>2004</td>
<td>Direct School Admission Scheme</td>
<td>Offered students the opportunity to gain admission to secondary schooling based on specialised strengths rather than solely upon academic grades (Tan, Chow, &amp; Goh, 2008)</td>
</tr>
<tr>
<td>2005</td>
<td>Teach Less, Learn More (TLLM)</td>
<td>Emphasised pedagogical change to encourage active and independent learning by trimming syllabus content and to enhance critical thinking and inquiry-based learning among students.</td>
</tr>
<tr>
<td>Year</td>
<td>Policy / Initiative</td>
<td>Brief Description</td>
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<tr>
<td>2006</td>
<td>Revised Junior College Curriculum</td>
<td>Offered greater breadth and depth of learning as students study at least one subject beyond their main specialisation and have the choice of differing levels of study within each subject</td>
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<tr>
<td>2009</td>
<td>Third Masterplan for ICT in Education (Masterplan 3)</td>
<td>Masterplan 3 built on previous masterplans and aimed to develop students’ self-directed and collaborative learning using ICT (MOE, 2017d).</td>
</tr>
<tr>
<td>2009</td>
<td>Revised Desired Outcomes of Education</td>
<td>The first set of Desired Outcomes of Education in 1997 was re-articulated into four specific desired outcomes of education, namely, Confident Person, Self-Directed Learner, Active Contributor, Concerned Citizen.</td>
</tr>
<tr>
<td>2010</td>
<td>21CC Framework</td>
<td>A ‘total curriculum’ framework that articulated Singapore’s education vision where the four Desired Outcomes of Education are underpinned by a suite of emerging 21CC, social emotional competencies, and values (see Figure 1).</td>
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<tr>
<td>2010</td>
<td>Primary and Secondary Education Review and Implementation (PERI and SERI)</td>
<td>The PERI committee was formed to evaluate and improve the quality of primary education in Singapore, including social-emotional development, non-academic curriculum and lifelong learning (MOE, 2009b). Key initiatives included Holistic Assessment; Programme for Active Learning; PE, Art &amp; Music Education; Engaging Pedagogies; Strategies to Ensure more Attention for Individual Pupil Development; and enhancing infrastructure and investing in a quality teaching force. The SERI committee was the equivalent of their PERI counterpart to enhance the quality of secondary education in Singapore.</td>
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<tr>
<td>Year</td>
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<td>Brief Description</td>
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<tr>
<td>2012</td>
<td>Teacher Growth Model</td>
<td>A professional development model to encourage teachers’ lifelong learning and personal well-being.</td>
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<tr>
<td>2012</td>
<td>Values-In-Action (VIA)</td>
<td>Learning experiences that encourage students’ involvement in community and nurture them to become socially responsible citizens.</td>
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<td>2013</td>
<td>Applied Learning Programme (ALP) and Learning-for-Life Programme (LLP)</td>
<td>To be started in all schools by 2017, the ALP focuses on interdisciplinary knowledge and the application of skills to professional real-world settings; the LLP aims to nurture students’ character and values, and develop their interpersonal skill.</td>
</tr>
<tr>
<td>2015</td>
<td>Fourth Masterplan for ICT in Education (mp4)</td>
<td>The goal of mp4 is to develop future-ready and responsible digital learners. It is aligned with student-centric and values-driven education and aims to help students develop mastery of subjects and enhance their 21CC (MOE, 2017e).</td>
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**PREPARING FOR THE FUTURE**

Today, like many developed economies, Singapore faces many challenges. For example, Singapore operates in an uncertain and competitive global economy that is transitioning to a period of more stable, but slower growth (The World Bank, 2013). In such an operating environment, Singapore will need to achieve economic growth through painful economic restructuring by working on higher productivity. In the work environment, Singapore faces technological disruptions in businesses arising from advancements in technology. With rising affluence and life expectancy, Singapore families also have rising aspirations and expectations in terms of their standard of living and
quality of life. Singapore is facing an aging population (National Population and Talent Division, 2016). In 2016, an older citizen who is 65 years and above is being supported by 4.7 working adults. By 2030, it is projected that an older citizen will be supported by 2.3 working adults. Singapore faces increasing risk from natural disasters such as extreme weather and constant threats from terrorism.

To address the above challenges, Singapore’s leaner workforce will need to be more productive, responsive to change, resilient, innovative and creative. To prepare such a workforce, we believe that education must help our students to learn how to learn and how to live so that they are prepared for life (and not just for preparing for examinations) through purposeful learning. We define purposeful learning as follows in Figure 2.

Figure 2: Life-long, Life-wide, Life-deep and Life-wise Learning in Purposeful Learning

<table>
<thead>
<tr>
<th>LIFE-LONG LEARNING</th>
<th>LIFE-DEEP LEARNING</th>
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<tbody>
<tr>
<td>Knowledge &amp; Dispositions over Time</td>
<td>Deep Disciplinary &amp; Conceptual Understanding</td>
</tr>
<tr>
<td>Process &amp; Design Skill Retention</td>
<td>Mastery, Autonomy &amp; Purpose</td>
</tr>
<tr>
<td>Metacognition</td>
<td>Adaptive Expertise</td>
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<tr>
<th>SOCIAL EMOTIONAL REGULATION &amp; WELL-BEING</th>
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<tbody>
<tr>
<td>LIFE-WIDE LEARNING</td>
</tr>
<tr>
<td>Adaptability &amp; Transferability Across Contexts</td>
</tr>
<tr>
<td>Multiple Perspectives</td>
</tr>
<tr>
<td>Interdisciplinary Understanding</td>
</tr>
</tbody>
</table>

If our students are engaged in purposeful learning, they will be able to develop the necessary competencies, skills and dispositions to learn, relearn and unlearn in response to the changes required in their work environment and in their lives.
The terms, life-long learning, life-wide learning and life-deep learning are not new in the literature (Bell, Tzou, Bricker & Baines, 2012). However, life-wise learning may be a new term that has not been used in the literature. We will elaborate what we mean by life-long learning, life-wide learning, life-deep learning and life-wise learning and their relevance to purposeful learning.

**Life-long Learning**

For life-long learning, we think that our students will need to be prepared well in the following three areas — (a) Knowledge and Dispositions, (b) Process and Design Skills, and (c) Metacognition.

**Knowledge and Dispositions.** With the advancements in science and technology, we know that there is an inherent risk of the knowledge acquired in formal education at schools and institutions of higher learning becoming obsolete with age (Paccagnella, 2016). This knowledge gained will not be sufficient to last a lifetime without regular updating of the knowledge. An ideal curriculum in formal education should be a T-shaped curriculum where there is both breadth and depth. Breadth should give students a strong foundation for future learning and to allow them to discover their interests and strengths. Depth should allow students to pursue their chosen interest or strength at a deeper level. However, there is no guarantee that students who have acquired knowledge will want to apply or grow their knowledge. Hence, there is also a need to cultivate learning dispositions or habits of mind i.e. the inclination to want to learn and to persist in their learning (Claxton, 2002; Perkins, Ritchhart, 2002; Jay & Tishman, 1993). Some examples of learning dispositions include being curious and to have the determination to learn, being flexible in their approach to learning and being keen to collaborate without being dependent on others.

**Process and Design Skills.** As tasks and situations in the workplace become more complex and uncertain, we will need to ensure that our students are equipped with process and design skills. Partnership for 21st Century Learning, an organisation that seeks to serve as a catalyst for 21st
century learning by building collaborative partnerships among education, business, community, and government leaders (P21, 2017) articulates three sets of skills, namely (a) learning and innovation skills that include creativity, critical thinking, communication and collaboration, (b) information, media and technology skills that include literacies in information, media and info-communication, and (c) life and career skills that include, for example, social and cross-cultural skills, leadership skills and initiative. There are established programmes that encourage the development of these skills in formal education that include Art-Science programme (Edwards, 2008) and Design Thinking programme (Koh, Chai, Wong & Hong, 2015). MOE (2017c) also articulates the acquisition of similar skills in their framework for 21st century skills.

Metacognition. For our students to be effective learners, we will need for them to be metacognitively aware. Metacognition is about being awareness of one’s thinking and learning i.e. to be reflective about what one is thinking and how one is learning. For Mayer (2016), metacognition in learning will require 3 types of awareness, namely, (a) metacognitive beliefs i.e. beliefs on how he or she process information, his or her strengths and weaknesses, his or her proficiency level and his or her assessment of task demands, (b) metacognitive strategies i.e. knowing how one is planning, monitoring, managing and evaluating the cognitive activity relating to learning and (c) cognitive strategies i.e. knowing what needs to be done to learn effectively.

Life-wide Learning

For life-wide learning, we think that students will need to be prepared for (a) Adaptability and Transferability Across Contexts, (b) Multiple Perspectives, and (c) Interdisciplinary Understanding.

Adaptability and Transferability Across Contexts. Given that there will be a need to respond to new problems or tasks in the workplace, we will need to design learning opportunities for our students to be able to transfer their learning across contexts — within formal learning across topics and subjects as well as between formal and informal learning.
Royer (1979) focused on the study of transfer of learning to designing learning experiences to facilitate learning in two situations. First, we need to design learning experiences such that previous learning will facilitate the learning of new materials. Second, we need to design learning experiences such that the learning acquired can be applied to resolve real-world problems and tasks.

**Multiple Perspectives.** We know that real-world problems are complex and multi-dimensional in nature. In finding solutions to such real-world problems, we will need our students to have the opportunities to solve problems that will require them to take multiple perspectives and to work out solutions that achieve acceptable balance of the critical considerations such as philosophical, technical and socio-emotional dimensions. That is, they will be working out solutions that are not perfect but optimal in balancing various considerations that impact the problems and solutions.

**Interdisciplinary Understanding.** To work with complex problems, we will need to provide students with sufficient learning experiences that allow them to integrate knowledge and disciplinary approaches from two or more disciplines to solve problems and tasks. We think that students should have the opportunities to work beyond the subject silos on complex problem solving that should draw on two or more disciplines for solutions.

**Life-deep Learning**

For life-deep learning, we think that students will need to be prepared for (a) Deep Disciplinary & Conceptual Understanding, (b) Mastery, Autonomy and Purpose, and (c) Adaptive Expertise.

**Deep Disciplinary and Conceptual Understanding.** For our students to be able to transfer their learning to different contexts, we will need to design learning experiences that will have them acquire deep understanding of the concepts and methods of the disciplines that they learn. Students who have a deep understanding of the concepts and methods of a discipline
will be able to apply their understanding to solve disciplinary problems including novel ones. We will need to design learning experiences that will give them the opportunities to acquire deep disciplinary and conceptual understanding.

**Mastery, Autonomy and Purpose.** To be motivated to learn deeply, our students need to have mastery, autonomy and purpose in their learning (Pink, 2009). We know that mastery requires practice. Practice may not necessarily be conceived negatively but can be seen as skills honed with months and years of application in multiple situations and contexts. Mastery and persistence (despite failure) are intertwined. Persistence through iterative cycles of experimentation and learning through the process, including developing the heuristics and habits of mind to analyse, regulate, and persist is critical especially if we are to navigate and weather the many challenges and uncertainty in the future. Our students should persist in their learning when they have some degree of autonomy and purpose to drive their learning. Autonomy gives students a sense of being able to be self-directed while purpose gives meaning in their learning. During the course of education, we will need to design learning experiences for our students that will give them the opportunities to develop mastery, autonomy and purpose in at least some area of their learning.

**Adaptive Expertise.** Bransford and his colleagues (2006) differentiate “routine expertise” from “adaptive expertise”. Routine experts will be able to solve routine problems with greater efficiency over time. On the other hand, Adaptive experts will be expanding the breadth and depth of their expertise over time making them very flexible in novel problem solving in the long run. The adaptive experts will be effective in bringing about innovations and new inventions to the market. Bransford (2007) suggested that we will need to design learning experiences that will allow our students to “experience processes of inquiry and innovation — including the struggles and doubts” and a new approach to assessment that will measure success in adaptive expertise. We will need to design learning experiences and assessment tasks for our students to have some
opportunities to practice some form of adaptive expertise. There should be more scope of doing so at higher education than K-12 education.

**Life-wise Learning**

For life-wise learning, we think that students will need to be prepared for (a) Values, Morals and Character, (b) Practical Wisdom, and (c) Historical Empathy.

**Values, Morals and Character.** Given that we are operating in a work environment that is competitive, uncertain and complex, there can be a tendency for people to do what is expeditious or convenient rather than what is right to do. We will need to design learning experiences that will create opportunities for our students to do what is right for themselves and for the community even when people are not looking. They should be able to do what is right when they have wisdom that are anchored in values, morals and character. Hence, education in schools, in families and in the wider community should ensure that students acquire the necessary values and morals that will allow them to have the strength of character to know what is morally right, to be able to feel strongly about situations that are not right and to have the moral courage to do what is right to change the situations (Lickona, 2009).

**Practical Wisdom.** If we want people to resolve ethical situations that will be in the long-term interest of the community, we should cultivate in our students what Aristotle called practical wisdom. We should provide learning experiences in schools and in higher education where our students have the opportunities to exercise practical wisdom. Schwartz and Sharpe (2010) explain practical wisdom as “the right way to do the right thing”. In addition to understanding the ethical situations, people who have practical wisdom will be able to act on their understanding of the ethical issues and use the right approach to resolve them i.e. they will have the flexibility to know when to improvise.

**Historical Empathy.** During our school leadership research, we “discovered” a new leadership phenomenon in the school leaders that we
had studied. We have tentatively termed this leadership phenomenon as “Historical Empathy”. In leadership research, we know that leaders conduct an analysis of the current situation in their organisations as part of strategic planning. This analysis will be used to determine the actions required to get an organisation to where it should be. School leaders who demonstrate what we call Historical Empathy have the wisdom to act on their understanding of the analysis of current situations to determine an optimal path of change that leverages the culture, structures and people. These school leaders’ understanding of the latter conditions enables them to make good decisions on the change pathways that are based what to change first, what strengths to leverage the change, what obstacles should be minimised to accelerate change, what structures to keep, to enhance and change to support the change and who should and should not be involved in the change at the initial stage and during implementation. We will need to provide learning experiences in the form of projects in schools where our students will have the opportunities to exercise Historical Empathy in some meaningful way.

**Socio-emotional Regulation and Well-Being**

For our students to be effective in life-long learning, life-wide learning, life-deep learning and life-wise learning, they should be capable of socio-emotional regulation and should have a sense of well-being. Students who can regulate their emotions and social interactions well will not only be successful learners but also will be effective in life. Students will be effective in their learning when they are in a safe and supportive learning environment where they can express themselves freely and where they can try, fail safely and be able to pick them up again from their failure.

**Four Lives of Learning as Vision**

The framework of life-long learning, life-wide learning, life-deep learning and life-wise learning offers an ideal vision of the comprehensive range of knowledge, skills, competencies and dispositions required by students to prepare them successfully to meet the challenges of the future. The
framework offers those who are interested in the outcomes of education based on purposeful learning for their students to identify possible gaps in their education that may require closing. However, we acknowledge that, in real-world implementation, there will be inevitably some trade-offs to be made as schools will be constrained by expertise, resources and time.

OVERVIEW OF EDUCATIONAL INNOVATIONS IN SCHOOLS

In the subsequent chapters, we share our findings and that of our colleagues on the role of school leadership in bringing about educational innovations in their respective schools.

In the following chapter on “Educational Leadership in Singapore: A Historical Development”, we share the role of MOE in putting in place the necessary policies and initiatives to enable the leadership in school to lead educational innovations. While it is a long chapter, readers should find the story of the historical journey of educational leadership in Singapore to be interesting as it will be told by using the personal voices of the senior educational leaders at MOE who were and are significant contributors to the formulation of policies and in leading the implementation of the initiatives described. The story told will provide the necessary context of how the educational leadership came to be and to appreciate the educational innovations led by the school leaders described in subsequent chapters.

In Chapter 3 on “Significance of Educational Leadership: Case for Singapore Schools Today”, we share that to sustain educational innovations within a school and to scale these innovations beyond the school will require an emergent type of leadership which we term as ecological leadership. The need to sustain and scale innovations in schools may require school leaders to go beyond exercising just distributed leadership to ecological leadership. We argue that this leadership does not completely originate from one individual but from a propensity to uncover leaders from the middle. As we deconstruct ecological leadership into the various levels of ecology, it becomes
apparent that there are social interactions and networks between the levels that are transferring knowledge and capacity. This ecological leadership is based on a bidirectional alignment of leadership within and across the ecological subsystems that include leadership within schools, across formal and informal clusters of schools and up to the MOE Headquarters. This bidirectional alignment can be achieved by leveraging multi-level networks, norms of practice and trust to improve the learning of our students.

In Chapter 4 on “Overcoming Impediments to Reform: Building a Sustainable Ecosystem for Educational Innovations”, we share how school-to-school collaborations can potentially overcome impediments to reform by leveraging ecosystem carryover effects, which are defined by Ron Adner (2012) as the process of leveraging successful elements that have been constructed in one ecosystem to create advantages in constructing a new ecosystem. Based on our studies, there are four types of carryover effects that can occur in self-renewing learning networks that engender new knowledge. They are structural, economic, socio-cultural and epistemic ecosystem carryover effects. Through three cases of innovations, we explain how these effects can be propagated by various actors in our system to overcome initiative, interdependence and integration risks associated with educational innovations. We postulate that when the four ecosystem carryover effects are present in the school-to-school learning networks, we can be more confident that the learning would be deeper and more sustainable, whilst also acknowledging the fact that individual school context does matter, and thus giving rise to variegated outcomes.

In Chapter 5 on “Empowering Partnerships for School-based Innovation Scale and Sustainability”, we share the importance of partnerships among schools, families, and communities as a means for supporting student developmental learning. Within the context of Singapore schools, we found that efforts to create and sustain school partnerships face accountability pressures arising from high stakes testing where discretionary time for teachers in public schools is a scarce and dwindling resource. There is also a need to innovate teaching and
learning attuned to the many demands of the future uncertainties. Hence, collaborative partnerships must be carefully designed to yield visible and valued benefits for the mutual parties and, more importantly, to ensure that there will be benefits to the school system. In this chapter, we describe the partnership design strategies that are embedded in the practical enactments of a school-based transformative education agenda in Singapore. Through a case example of a Singapore secondary school, we share a partnership model that focuses on not only the development of school-based innovations within the school but also the scaling and sustainability of these innovations beyond its initial context of development to ‘partnering’ schools on these innovations.

In Chapter 6 on “Educational Change for the 21st Century: Leadership from the Middle”, we share on how the Singapore education system changes fluidly through research and pedagogical experimentation to stay relevant to current trends and needs. In meeting the needs of 21st century learning and competencies, it seeks to maintain a balance between performative (teaching to the test) pedagogies and inquiry-based, student-centred pedagogies. This balancing process results in tensions and misalignments within the system such as the translation of policy to practice, the assessments of content that relate to 21st century competencies, and the disparities in teacher capacities, amongst others, for reform-change and epistemic change for school improvement. In this chapter, we show how “leadership from the middle” via a cluster or network of schools manages these tensions. We found that it is possible to facilitate the diffusion of Curricular Innovations (CIs) within and across schools by leveraging “leadership from the middle” as the driving force for change through distributed leadership that taps on middle leaders at every layer of the system (macro, meso and micro). These CIs may also be facilitated by developing sustainable centralisation-decentralisation mechanisms for coherent upward and downwards alignment of the system layers. To improve teaching and learning, we found that apprenticing leadership and ecological leadership (see Chapter 3) as being instrumental in ensuring horizontal and vertical alignment through the layers to nurture open collaborative cultures, ‘mentoring’ system and to mitigate high power distance. School-to-
school networks such as Networked Learning Communities (NLCs) can facilitate communications at all levels and encourages greater collaboration, sharing and documentation of CIs to spur epistemic change in teachers’ beliefs, mindsets and agency to change teaching and learning dynamically.

In Chapter 7 on “Developing Teacher Leadership to Pedagogical Practice”, we argue that it will not be sufficient to institute leadership positions and creating career path for progression to develop teacher leadership in schools. We argue that, to sustain the development of teacher leadership, we need to deliberately build a culture of self-improvement in schools. For us, teacher leadership is about enabling all teachers to demonstrate leadership that will enable the educational system to become self-improving and to move towards purposeful learning. We identify three pathways for the development of teacher leadership. We also share insights from our study on a system-level professional development programme that aims to engender a culture of teacher leadership capable of bringing about purposeful learning for our students. Finally, we provide an analysis of the issues and challenges in teacher leadership implementation.

In Chapter 8 on “Inductive Leadership: Activating Community-Oriented Student Agency towards School Improvement”, we share a case study of a very successful secondary school in terms of both absolute and value-added traditional examination test scores. As part of the school’s broader efforts to educate its students to be more future-ready, it has implemented a revised curriculum that is more student- and inquiry-oriented. We studied the school using the multi-perspectival in-depth case study methodology of the International Successful School Principalship Project (ISSPP). In this study, we identified the notion of “agentic student leadership” that could be leveraged to catalyse and spur school change and school improvement through the activation of community-oriented student agency. We unpacked this notion of “agentic student leadership” into its constituent 3-stage process that had been enacted by the principal, commencing from initiation and leading to sustainability. We discuss how “agentic student leadership” constitutes
2nd order improvements in schools, as well as argue for the location of its potential contribution to the literature on school leadership and school improvement. In this chapter, we specifically devise the term “agentic student leadership” as a strategy for school improvement as it is different from the conventional understanding of student leadership in school settings or the concept of “student voice”.

In Chapter 9 on “Teachers at the Heart of System Change: Principles of Educational Change for School Leaders”, we share that people, especially teachers, make all the difference in educational change. We found that the highest leverage point for system change is when teachers make the appropriate epistemic shifts. The concluding chapter draws together the lessons learned on how meaningful educational change occurs from the educational innovations studied. The lessons reminds readers that the foundation of purposeful learning — life-long, life-wide, life-deep, and life-wise — is grounded on learners engaging in experiential learning where there is dialogue and collaborative interactions (among learners that include students, teachers, or school leaders) anchored on real-world activities. The chapter revisits the important constructs of leadership and how it facilitates the inextricable links between the change-and-the-learning process.

MANAGEMENT OF TENSIONS WITH EDUCATIONAL INNOVATIONS

Going forward, we need an education that will prepare Singaporeans to remain competitive internationally and to operate in a volatile, uncertain, complex and ambiguous world where change and disruption are the norms. In this challenging operating environment, we expect that the policy makers and school leaders will need to provide leadership that manages a calibrated balance in the following four tensions: centralisation versus decentralisation, constancy versus change, standardisation versus diversity and control versus autonomy.

At the system level, policy makers should seek to balance between centralisation and decentralisation. In centralisation, we will be able to
reap economy of scale by adopting best practices and research-proven strategies to achieve the desired educational outcomes which ensure better utilisation of scarce economic resources. In decentralisation, we will enable schools to innovate in pushing the frontier of learning and to differentiate the learning in response to the constant changes in both local and global operating environment.

School leaders need to understand what should remain constant and what should change in nurturing the holistic development of our students. For example, what should stay constant is an education that ensures our students are inculcated with values including being rooted in Singapore, acquiring critical and creative thinking skills and dispositions as well as socio-emotional learning skills, developing disciplinary ways of knowing and being anchored in foundational disciplinary knowledge. However, what should change is how we engage our students in their learning and in the pedagogical practices that we adopt to enhance learning in response to externalities such as changes in family and student profiles.

School leaders need to balance between standardisation that allows efficient management and proper governance versus diversity, which may be messy but builds capabilities to respond to changes. Standardisation will facilitate the development of systems and processes that will ensure our students are able to achieve high averages consistently. On the other hand, diversity will facilitate the development of a diversity of talents to meet changing needs and unanticipated challenges.

In pushing for innovation in schools, school leaders need to balance between achieving control and giving autonomy to teachers and students in learning. School leaders need to have control over the conditions and outcomes of learning initiatives introduced in schools to ensure effective and consistent implementation. However, they also need to give teachers and students a sense of autonomy or agency to be empowered to own the innovations in learning and to achieve desired outcomes that are not planned or anticipated but are important to develop flexibility in response to changes.
While the context of the research findings reported in this book are based on the experiences of educational innovations in Singapore schools, we believe that the principles (see Chapter 9) that support and sustain educational innovations in schools to prepare students for the future are likely to be applicable to educational systems internationally. We believe that the principles of change articulated in this book will remain relevant, but the actual issues and challenges faced will differ based on the context in which they are being applied.

In the following chapter, which is a long chapter, we share what we believe is a comprehensive account of the journey that educational leadership in Singapore has taken since independence to the present times. We hope that an appreciation of this educational leadership journey described will provide readers with the necessary context to understand how the present Singapore came to be and why the Singapore schools embarked on the educational innovations that they did. In the subsequent chapters, readers will have an appreciation of how the schools and school leaders that we have studied managed a calibrated balance in the four tensions highlighted, namely, centralisation versus decentralisation, constancy versus change, standardisation versus diversity, and control versus autonomy.

References


