

# High-Performing Education Systems in Asia: Leadership Art meets Implementation Science

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**Abstract** This article looks at high-performing education systems in Asia through the lens of leadership and leadership development. It proposes that the top-performing education systems systematically build the leadership capacity for improvement and that this is part of an implementation science geared to maximizing performance. Drawing upon initial findings from a cross-national comparative study (The 7 System Leadership Study is funded by the University of Malaya and involves Malaysia, Indonesia, Singapore, Hong Kong, Russia, England and Australia.), the article focuses upon two high-performing systems in Asia, Singapore, and Hong Kong. The article concludes by arguing that the top performing systems in Asia, as determined by international comparative data, not only create the leadership capacity to consistently outperform others but also invest in an implementation science that defines, delineates and ultimately, determines exceptional performance.

**Keywords** System reform ·  
High performing systems in Asia ·  
Implementation science · Leadership capacity

## Introduction

The world is changing and changing fast. Nowhere is this clearer than in Asia where the kaleidoscope of economic power is being rapidly and irrecoverably reconfigured. Important political shifts are occurring in this region, which are destined to create major economic waves in the

complex global marketplace. Global forces are rapidly posing new and demanding challenges to individuals and societies alike and increasingly, competition between countries now revolves around generating professional and human capital (Hargreaves and Fullan 2012). The forces that are currently reshaping and redefining the global economic future are relentless, powerful, and unstoppable. The financial forecasts tell the same, consistent story: Asia is fast becoming the world's economic powerhouse.

While Asia's extraordinary economic growth is unquestionable, growing international attention is turning to the region's equally remarkable educational trajectory (Jensen 2012). Of the 65 countries and provinces participating in the OECD's Program for International Student Assessment (PISA) in 2012,<sup>1</sup> the top performers were all in Asia. Shanghai-China scored highest in mathematics, with a mean score of 613 points—the equivalent of nearly three years of schooling above the OECD average. Following Shanghai, in descending order, Singapore, Hong Kong-China, Chinese Taipei, and Korea comprise the top five performers in mathematics. The highest-performing education systems in reading, in PISA 2012, were Shanghai-China, Hong Kong-China, Singapore, Japan, and Korea. In science, the line up is one again very familiar with Shanghai-China, Hong Kong-China, Singapore, Japan, and Finland holding the top positions (OECD 2012).

In 2011, Asian countries demonstrated, yet again, their prowess in mathematics achievement (TIMSS<sup>2</sup>) with Singapore, Korea, and Hong Kong, followed by Chinese Taipei and Japan, as the top-performing systems. At both the fourth and eighth grades, the five East Asian countries had the largest percentages of students reaching the TIMSS

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<sup>1</sup> <http://www.oecd.org/pisa/keyfindings/pisa-2012-results-overview>.

<sup>2</sup> Trends in International Mathematics and Science Study.

International Benchmarks, and the gaps were especially large at the highest levels.<sup>3</sup> At the eighth grade, data show that Asian countries, particularly Chinese Taipei, Singapore, and Korea, are now pulling away from the rest of the world by a considerable margin.

Despite some reservations about the PISA tests and rankings (Zhao 2014), it remains the case that, at present, a generally accepted measure of performance. This is not to say that they are the only measure or the right measure but rather to acknowledge that they are a benchmark that systems around the world are taking very seriously. Before the advent of international comparative data, there was a tendency for systems to be ethnocentric and to not look outside their geographical boundaries. As Mourshed, Chinizi, and Barber (2010, p. 24) argue ‘what has confused much of the discussion about system improvement in the past is that each system’s journey is different: each school system starts from a different point, faces different expectations, and operates in a different social and political context.’ Hence, the contemporary interest in comparative performance and in particular, the ‘high-performing systems’ in Asia (OECD 2012; Jensen 2012; Hargreaves and Shirley 2012).

There is currently a great deal of interest in why these systems perform so well. This attention has sparked much speculation, conjecture, and even misinterpretation about exactly how these countries outperform others. For example, it has been speculated that the PISA and TIMSS assessments favor the ‘test-orientated’ cultures associated with Asian education. The fact that these assessments involve skills that go far beyond routine memorization would tend to negate this viewpoint. In addition, the TIMSS data show that Asian students do not focus more attention on memorization than any other student group and that there is wide variation in the data concerning the importance of memorization (Leung 2002, p. 98).

The assertion that Asian students focus on ‘rote learning’ at the detriment of their problem-solving ability is another prevalent view. There is no question that there is a fixation with test preparation in these systems; it is a massive commercial enterprise (Zhao 2014). For example, in Hong Kong, the running of tutorial centers is a huge business with a turnover of billions.<sup>4</sup> The latest PISA analysis (OECD 2014), however, shows that despite this preoccupation with testing, which is also a feature of many Western systems, in terms of problem-solving skills,<sup>5</sup> the

top performers are once again the Asian education systems, with Singapore taking the first position (OECD 2014). Problem-solving tests were an optional extra following the PISA round in 2012 and were taken by 44 out of the 65 countries and administrations in the PISA rankings. The OECD report states that ‘students in Hong Kong-China, Korea, Macao-China, Shanghai-China, Singapore, and Chinese Taipei perform strongest on problems that require understanding, formulating, or representing new knowledge, compared to other types of problems’ (OECD 2014, p. 14). It also notes that ‘the proportion of students performing at the top level in problem solving and in mathematics, reading, or science can be considered a measure of the depth of this pool. These are top performers who combine the mastery of a specific domain of knowledge with the ability to apply their unique skills flexibly, in a variety of contexts. By this measure, the deepest pools of top performers can be found in Singapore, Korea Shanghai-China, and Chinese Taipei’ (OECD 2014, p. 60).

The position of the high-performing education systems in Asia is further consolidated by this latest OECD analysis. There is no doubt that performance on the PISA test of problem solving is influenced by affective and motivational factors in addition to cognitive potential. The willingness to engage with problem solving is also influenced by the assessment situation and its mode of delivery (OECD 2014, p. 111). But there are undoubtedly some cultural and contextual factors that are highly influential in the success of these education systems. It remains the case that young people in high-performing Asian countries are expected to do well at school, they work exceptionally long hours, they are often tired and stressed, and they have parents with very high aspirations for them.

This ‘romanticized misery’ is a very real and pervasive part of the educational landscape fueled by a Confucian belief about the role of effort and the importance of the individual to strive and work exceptionally hard (Zhao

Footnote 5 continued

- Exploring and understanding. This involves exploring the problem situation by observing it, interacting with it, searching for information and finding limitations or obstacles; and demonstrating understanding of the information given and the information discovered while interacting with the problem situation.

- Representing and formulating. This involves using tables, graphs, symbols or words to represent aspects of the problem situation; and formulating hypotheses about the relevant factors in a problem and the relationships between them, to build a coherent mental representation of the problem situation.

- Planning and executing. This involves devising a plan or strategy to solve the problem, and executing it. It may involve clarifying the overall goal, setting subgoals, etc.

- Monitoring and reflecting. This involves monitoring progress, reacting to feedback, and reflecting on the solution, the information provided with the problem, or the strategy adopted. (OECD 2014, p. 31).

<sup>3</sup> [http://timssandpirls.bc.edu/timss2011/downloads/T11\\_IR\\_M\\_Executive\\_Summary](http://timssandpirls.bc.edu/timss2011/downloads/T11_IR_M_Executive_Summary).

<sup>4</sup> Attributed to Paula Kwang.

<sup>5</sup> For the purpose of the PISA assessment, the cognitive processes involved in problem solving are grouped into four problem-solving processes:

2014; Kwan 2014). Zhao (2014, p. 12) argues that ‘because some authoritarian education systems seem to generate better PISA rankings, it has been concluded that systemic arrangements designed to enforce government-prescribed, uniform standards upon all children should be emulated by the rest of the world.’ His position is that the international benchmarking has led to the glorification of educational authoritarianism. Undoubtedly, caution is needed when explaining the success of any education system, particularly for those working and living outside it. This is why more detailed, contextually grounded, empirical studies are needed of a comparative nature that goes beyond the numbers and superficial country accounts.

While the superior performance of Asian students is unquestionably shaped by the values that they hold and the cultural features they share, this is not the entire story. Explanations of high performance cannot be attributed to cultural factors alone, however, powerful and invasive they might be. Indeed, the various assessments of high-performing education systems tend toward a structural analysis and exposition rather than cultural stereotyping (OECD 2011; Mourshed et al. 2010; Jensen 2012). While culture is undoubtedly important in explaining exceptional performance, for those education systems aspiring to improve, it is the structural components and features of the high-performing countries that remain of most interest (OECD 2010a, b, c, 2011).

### System Improvement

Countries around the world have been increasingly preoccupied with whole system improvement and securing better educational outcomes for all young people. Fueled by a growing ‘international interdependence,’ the education sector is now more focused than ever before on responding to international benchmarks and expectations (Malone 2013, p. 129). The PISA rollercoaster ride, for the moment, continues. The global knowledge economy is now recognized to be ‘a game changer’ with governments and educators everywhere seeking ways to improve the performance of their education systems (Stewart 2012). While it is clear that no single country or system has all the answers to the educational challenges of the new global marketplace, there are certain structural aspects of the top-performing education systems that are worth consideration.

This is not to suggest that simply transplanting the approaches of high-performing systems is the answer. Policies created elsewhere rarely ‘travel well’ with little guarantee of success (Hargreaves and Shirley 2009, 2012). To replicate the policies of others, as some systems have done, is unlikely to bring long-term gains. Evidence shows that policy borrowing is fraught with difficulty and laden

with disappointment (Harris 2012). It also highlights that if sustained improvement is the goal, then policies have to be embedded into the very ‘fabric of the system’ (Mourshed et al. 2010, p. 11). The data from the ‘7 System Leadership Study’ are showing that a more productive place to start is by looking at the actual mechanics of implementation and the capacity building processes that actually make a difference.

Top-performing systems in Asia do not have a monopoly on good ideas, new strategies, or intelligent policies. So what exactly makes the difference? One thing is categorically clear; high performance is certainly no accident (Hargreaves, Boyle and Harris 2014). Success is a result of a carefully crafted and highly structured process of delivery. While there may be variation in the implementation processes in the top-performing Asian countries, in terms of sequence, roll out, and timing, the net result is exactly the same (Ng 2012). Those at the helm of effective system reform in the top-performing systems understand that good ideas are of little use without the capacity and mechanics to deliver them.

The remainder of this article focuses on two components that empirical data<sup>6</sup> are showing, which are important features within the amalgam of high performance: firstly, the ‘art’ of creating the leadership capacity for change and secondly, an implementation ‘science’ that scaffolds, guides, and drives exceptional performance.

### Leadership Capacity

As the high-performing systems clearly exemplify, moving a system from good to great is challenging enough but keeping it there requires going far beyond top-down prescription and routine policy delivery (Stewart 2012). While high-performing systems know exactly how to track and monitor progress against implementation plans (Spillane and Coldren 2011), they also invest heavily in capacity building. Evidence shows that without purposeful, focused, and sustained capacity-building approaches, significant improvements, at the school or system level, are likely to be superficial and short-lived (Fullan 2010).

Capacity building, however, is much more than just routine re-skilling or up-skilling. As Fullan (2010, p. 57) argues ‘individuals and groups are high in capacity if they possess and continue to develop the knowledge and skills, if they are committed to putting the energy to get important things done collectively and continuously.’ At the system level, capacity building ‘is a highly complex, dynamic, knowledge-building process, intended to lead to increased student achievement in every school’ (Sharrat and Fullan

<sup>6</sup> Seven System Leadership Study.

2009, p. 8). Evidence shows that even the best policies cannot succeed without qualified, dedicated, and skilled personnel to deeply implement them. It highlights that without skilled leaders and competent leadership at all levels of the system, change and improvement are less likely to occur (Harris and Jones 2014).

Research underlines a solid and important relationship between leadership capacity and organizational performance (Hargreaves et al. 2010). The evidence shows that school leadership has an important impact on student outcomes and academic performance (Robinson 2008; Hallinger 2009; Leithwood et al. 2008). Leadership is also a very important variable in securing school effectiveness and delivering school improvement (Reynolds 2010; Mujijs and Reynolds 2010; Harris et al. 2013a). The extensive and expansive international literature on educational leadership highlights its centrality in school and system transformation, yet much of this evidence is still derived predominantly from a Western context (Walker and Dimmock 2006). With the spotlight now firmly on high-performing systems in Asia, exploring and understanding their leadership practices and models would seem to be important.

In 2012, research funding was obtained to compare the leadership practices and models in seven systems, four of them in Asia. The core hypothesis of the ‘7 System Leadership Study’<sup>7</sup> is to truly understand that high performance requires a diverse and comparative perspective. So far, the focus has been exclusively on those systems performing at the highest level (Jensen 2012; Stevenson 1992). Consequently, this study is deliberately looking at seven systems that perform differentially on international benchmarks.<sup>8</sup> The first stage of this three-year study has been completed, and this has involved several data collection visits to each of the participating countries. The research is a mixed methods design, incorporating principal and teacher surveys and multi-site qualitative studies involving semi-structured interviews, focus groups, and classroom observation. Both qualitative and quantitative methods are being used for cross-validating data and findings.

<sup>7</sup> This research study is adopting a comparative, mixed methods design, incorporating documentary analysis, surveys and multi-site, qualitative case studies (Eisenhardt 1989; Maxwell and Loomis 2003; Merriam 1998; Tashakkori and Teddlie 2010; Yin 2002). Case study accounts are being developed using a *common analytical framework* that will enable *systematic comparison* between the leadership development approaches in different countries. Specific cross-case analysis techniques will be deployed, such as case-ordered effects matrix, variable-by-variable, casual models, and casual networks (Miles and Huberman 1994).

<sup>8</sup> For more information on the research study email.7systemleadership@gmail.com.

The ‘7 System Leadership Study’ aims to offer a contemporary, comparative analysis of reform, development, and improvement in differentially performing education systems through a three-year contextualized and systematic empirical investigation. It is also exploring the relationship between leadership development and leadership practice through grounded and validated evidence. The next section of this article draws upon emerging findings from this study and literature reviews to highlight the ‘art’ of leadership development in two high-performing systems.

### Singapore and Hong Kong

The core purpose of the descriptive accounts that follow is to be indicative rather than comprehensive. Substantive and more detailed accounts of the leadership development and practices in both countries have been published elsewhere (e.g., Pang and Cheung 2004; Pang 2006; Ng 2012; NIE 2011; Kwan 2011; Walker and Dimmock 2006; Cheng 2010). Conversely, the core aim of these descriptions is to provide a basis for proposing firstly that high-performing systems deliberately build the leadership capacity for effective change and improvement and secondly that this capacity building is part of an ‘implementation science’ that drives and to a certain extent, determines high performance.

As a consistent top performer, Singapore is a major global success story and the subject of a great deal of scrutiny (Hargreaves and Shirley 2012; Ng 2012; NIE 2011). Through a steady succession of quality improvements, carefully considered policy decisions and a meticulous process of implementation, Singapore has created a world-class economy complimented by a world-class education system (Gopinathan 2007, 2012). Without question, Singapore is an example of a continually improving education system that has successfully reduced achievement gaps among different ethnic and income groups to ensure high-quality education for all (OECD 2011).

One of the most significant aspects of the education system in Singapore is its investment in leadership development at all levels. In Singapore, teachers with leadership potential are identified very early and groomed for leadership positions, generally progressing to subject head, head of department, vice principal, and then principal. Potential principals are selected after a grueling interview process that includes a two-day simulation test. Only after completing that test, they are allowed to enter the highly prestigious six-month ‘Leaders in Education’ program conducted by the Ministry of Education, which includes education coursework, field-based projects, and mentoring from senior principals, as well as examinations of other

industries and visits to other countries to learn about effective practices (Ng 2012).

The Leaders in Education Programme (LEP) is a six-month, full-time program at the National Institute of Education (NIE) in Singapore for educators who are chosen based upon their performance and their potential leadership ability. The LEP aims to produce school leaders 'with the capability to transform schools to be innovative learning communities that nurture innovative students and teachers in an economy driven by knowledge and learning (Ng 2008, p. 237). The course comprises knowledge content incorporating Interactive discussions that are intended to develop critical thinking. There is also a two-week overseas visit where participants must present a review of the key lessons to others. With an emphasis on knowledge creation, groups take on independent projects that aim to address the needs of the education system in Singapore in the future. The resulting plan is subsequently presented in public to NIE faculty and Singapore superintendents.

The LEP course involves the application of knowledge as each participant is attached to a school for six months of their training and must plan and launch an innovation that is of value to that school. In addition, school leaders are expected to demonstrate that they are instructional leaders by actively supporting the professional learning of all of their teachers. All this is neatly and efficiently packaged inside an extensive evaluation system where participants are expected to know about curriculum and pedagogy to show that they are able to offer timely and effective guidance and support to teachers. Evaluations of the LEP show that there has been a considerable return on the investment in leadership as principals are not only much more effective but also view themselves as active participants in the continued transformation and improvement of the system (Ng 2008, 2010a, b, 2012).

This leadership success story is replicated, albeit in a different way, in Hong Kong. Like many other education systems, Hong Kong has experienced a pervasive and influential transformation that has incorporated major changes in leadership development. The expectations on school leaders have changed. It is no longer enough for school leaders to think linearly and simply to react to challenges. In Hong Kong, school leaders are now required to think and act strategically to cope the challenges arising from an increasingly complex environment and desire to continually improve (Pang and Pisapia 2012).

In 2001, as a first step in its reform process, public assessments after primary schooling were abolished with immediate effect. In less than a decade, improvements in student performance as assessed in consecutive international comparisons are attributed to a shift away from rote learning to critical thinking (Mullis 2007). A crucial reform document *Learning to Learn* was published (Curriculum

Development Institute 2001) with the aim of changing the focus from teaching to learning. A new emphasis was placed on the process of learning rather than simply regurgitating facts. It also marked an important new era for leadership and leadership development.

In the decades prior to 2002, leadership preparation and development in Hong Kong tracked a rather 'incoherent and scattered course' (Walker and Dimmock 2006, p. 3). New principals were required to attend a basic 9-day (primary principals) or 10-day (secondary principals) course focusing on administrative matters only. The aim of the induction programs was to equip the newly appointed principals with the basic knowledge and skills needed for leading and managing schools. Preparation was linked only loosely to major education reform initiatives and rarely touched 'real' leadership life in schools.

As a matter of priority, therefore, a designated program was introduced for Newly Appointed Principals (NAPs) in the 2000–2001 to provide them with the support necessary for them to adapt to their new role. The program was underpinned by a locally developed set of standards organized as clustered sets of values, knowledge, skills, and attributes labeled *the six core areas of school leadership*: Strategic Direction and Policy Environment; Teaching, Learning and Curriculum; Leader and Teacher Growth and Development; Staff and Resource Management; Quality Assurance and Management; External Communication and Connection (Walker and Dimmock 2006).

With the increasing devolution of power to principals in Hong Kong, they are increasingly responsible for the process of reform. In the last decade, both leaders and teachers have been required to exercise greater professional autonomy and are increasingly responsible for making changes that will directly benefit their respective student bodies. In Hong Kong, as in Singapore, principals are not simply the recipients of change, they are not just on the end of top-down mandates, as in some other countries, but rather are actively engaged in the co-construction and the active implementation of policy (Walker and Kwong 2006; Kwan 2011).

While both Singapore and Hong Kong have developed distinctive, contextually specific forms of leadership preparation and training, there are some similarities. Firstly, there are very high expectations placed upon those engaging in the leadership development programs in both systems and a very rigorous evaluation process. The training is taken very seriously, and the stakes are high for those delivering and participating in the programs. Secondly, the emphasis is not just simply demonstrating that certain standards are met, as some systems require, or on knowledge acquisition, as some systems advocate, but also on the active application of leadership skills and the demonstration of expert leadership practice in context. In

the LEP program, for example, participants have to use their knowledge to guide the development of a school that is unfamiliar to them.

The pre-packaged leadership courses that characterize leadership development in so many countries are pre-disposed to solution-giving rather than problem solving. Hence, a great number of them fail to show any positive demonstrable impact (Harris and Jones 2014). This is not the case in either Singapore or Hong Kong as impact is the expected outcome of the program and is rigorously assessed. Thirdly, the leadership programs in both countries embrace peer collaboration as a way of promoting innovation and creativity. There is an enormous emphasis and responsibility upon participants to collaborate productively and effectively. In summary, future leaders in both countries are required to model and demonstrate the approaches to professional collaboration that they will subsequently expect of teachers (Harris et al. 2013b).

Many other countries or systems could easily claim that the features of these programs are not the preserve of Singapore and Hong Kong and they would be right. As already noted, there are many other leadership preparation and development programs around the world that have similar ingredients and processes but they fail to have the same impact. So why is it that the return on investment for leadership development in Singapore and Hong Kong is so much greater than other countries or systems? Putting issues of culture and context to one side, and looking only at the structural components, the proposition is that both systems embody an ‘implementation science’ that ensures that any policy, including those related to leadership development, are deeply and effectively embedded.

## Implementation Science

Over the past decade, the science related to developing and identifying evidence-based practices and implementing programs based on such evidence has gained prominence. Within this discourse, the issue of implementation has emerged as a significant lever in securing sustainable change and innovation (Fullan 2010). At its most basic level, implementation is viewed as the execution of a plan, a method or a design for achieving certain outcomes. In direct contrast, the concept of implementation science, drawn largely but not exclusively from the medical research field implies a more integrated, rigorous, and systematic approach to translating policy into practice (Madon et al. 2007).

As an emerging idea, implementation science is defined within the medical field as the study of methods to promote the integration of research findings and evidence into

healthcare policy and practice (Fixsen et al. 2005, p. 15). It locates the behavior of professionals and other stakeholders as a key variable in the uptake, adoption, and implementation of evidence-based interventions (Lemoine 2008). Implementation science uses common frameworks, principles, and best practices to study and improve the implementation of evidence-based or evidence-informed practices in the real world. Research is undertaken primarily to test new approaches as well as determine a causal relationship between the intervention and potential impact.

Implementation science focuses on evidence-based interventions in targeted settings (e.g., schools, workplaces, health care facilities, and public health departments) to sustain improvements. Stakeholder engagement, effectiveness studies, research synthesis, and mathematical modeling are some of the methods used by implementation scientists to identify strategies to embed evidence-based interventions. Implementation research is the scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice, and, hence, to improve the quality and effectiveness of services. Implementation science relies on co-ordination, communication, and consistency across multiple levels and stakeholders within the system to secure change and innovation that is deeply and properly embedded (Hernandez and Hodges 2003; Paine et al. 1984).

In education, implementation science involves careful policy choices, the rigorous and relentless embedding of those policies and the ability to continually evaluate, refine, and change. So what does this look like in practice? Let us look at one example. Since 1997, Singapore has been implementing ICT in education through its three Masterplans (Ng 2010a, b). Masterplan 1 (1997–2002) started out by aiming to allow students to have hands on computers for 30 % of their curriculum time, a target to be achieved by 2002. The goal of Masterplan 2 (2002–2009) was ultimately not about the use of technology but about changing the pedagogy and practice in the classroom to support thinking and independent learning among students. Masterplan 3 (2009–2014) is a continuation of the vision of the two previous plans but is now focused on deepening and strengthening the integration of ICT into the curriculum, pedagogy, and assessment to ‘enhance learning and develop competencies for the 21st century’ (MOE 2014).

This is a good example of implementation science in action because firstly, substantive research was undertaken to inform the development of each of the Masterplans. Secondly, the timescale for full implementation was not a year or two years as some policy makers would expect but seventeen years. The difference between policy delivery that is superficial and policy implementation that is deeply embedded is that adequate time is given for the system to

fully absorb the policy into practice. Thirdly and most importantly, there was a feedback loop. Between each Masterplan, there was constant evaluation and feedback about progress leading to adjustments in the implementation process and re-alignment between policy makers' expectations and practitioners' actions. So in concrete terms, at the end of Masterplan 1, its achievements were viewed as insufficient because of the constraints of the existing curriculum; therefore it was announced that 'we will design the curriculum itself to take account of new teaching methods...we will seek to integrate IT into the design of a more flexible and dynamic curriculum' (Tharman 2002).

After five years of the implementation of Master Plan 2, like its predecessor, what was achieved was deemed insufficient because there was a gap between teachers' familiarity with ICT and translating it into sound pedagogical practice (Ng 2010a, b). This subsequently became the driving force and impetus for the development of Master Plan 3 where the focus is upon changing pedagogical practice and student learning outcomes through the effective use of technology in the classroom. This is implementation science in action with all the accompanying rigor and relentless pursuit of certain outcomes but also with the flexibility to adapt and change direction if necessary. Initially driven from the center and adopting a top-down approach, the focus gradually shifts to a more organic and participative approach where implementation shifts from the 'headquarters to the schools' (Ng 2010a, b, p. 180).

In Hong Kong, the majority of schools are run by School Sponsoring Bodies (SSBs) which are usually the churches (Catholic Diocese, Anglican Diocese) and other Trade associations although they are funded by public money. There is generally an Education Chief (or even an Education Office) under the SSB to oversee the performance of schools. The SSB also appoints a school supervisor who assumes a similar role as that of a school superintendent in western systems to manage the school; and to whom the school principal is accountable. Schools under the same SSB are not only closely monitored by its Education Chief but are often compared with one another in terms of student academic outcomes, teacher capacity development, and other issues. Consequently, implementation science in Hong Kong schools is realized much more at the local level through the active support of the SSBs that provide a powerful infrastructure for quality delivery.

Unlike some other systems, Singapore and Hong Kong actively use implementation science to secure and sustain improvement. Each system pursues reform at scale in a rigorous and methodical way and successfully delivers policies informed by evidence. Policy makers spend a great deal of time researching the most effective practices before

advancing one single step or advocating a potential solution. Unlike many systems that perform at a much lower level, Singapore and Hong Kong do not pursue the latest fad or fashion, they are not distracted by some new idea or approach, they do not have multiple priorities that can change at any moment, and they do not pursue superficial or cosmetic change. Instead, they systematically, carefully, and thoroughly evaluate the evidence before formulating this into policy and putting it to the test of practice.

High-performing systems do not produce multiple policy frameworks that compete for professional time, energy, and resource. These systems are not at the whim of fickle policy makers who are more concerned with the bright new shiny thing than the hard work of actually putting policies into practice. Conversely, high-performing systems carefully craft and coordinate policies to suit their own context. They do not borrow policies made elsewhere for very different settings. Consistency is achieved by carefully aligning policies and by providing an efficient infrastructure that drives the entire implementation process. In contrast, low performing systems tend to have large "implementation gaps" between the policies enacted at the national, state, or even district level, and what actually happens in practice. There are frequent inconsistencies between the stated policy goals and the actual outcomes (Stewart 2012).

Education systems that perform exceptionally have policy coherence, policy alignment, and policy connection. Things are not left to chance but the process of embedding change is carefully monitored, assessed, and regulated (Harris and Jones 2014). High-performing systems do not jettison policies if things seem not to be working, they do not seek quick or immediate results. Rather they use a consistent set of student and school measures and only deploy interventions that will positively impact on learners, thereby creating a culture of continuous improvement.

## CODA

There is no perfect education system. All systems have their drawbacks, limitations, and idiosyncrasies. All systems struggle with creating the right balance between top-down and grass roots intervention, between uniformity and diversity, between central control and local autonomy. In recent years, Singapore and Hong Kong have not been alone in trying to get this balance right (OECD 2011). They have responded by placing an increasing emphasis on evaluation and feedback systems to guide their improvement, and they have invested heavily in aligning and strengthening the linkages between policy, research, and practice.

As highlighted earlier, globalization poses challenges for everyone and while one system cannot be transformed into another, there are some common denominator factors of high performance that are in evidence in systems that are at the top of their game. Firstly, high-performing systems invest in professional capital as one lever or driver of success (Hargreaves and Fullan 2012). They place a particular emphasis upon generating high-quality leaders and building the leadership capacity to deliver the outcomes they desire. Secondly, these systems focus their reform efforts primarily on improving student outcomes. Thirdly, high-performing systems have put in place feedback mechanisms that are used to re-calibrate the system when strong signals emerge that further support or change is needed. Finally and most importantly, high-performing education systems utilize an implementation science that informs, guides, and drives improvement at scale in a rigorous and reliable way.

In the frenetic search for explanations for the growing achievement gap between the East and the West, cultural differences are undoubtedly one major explanatory factor (Zhao 2014). There is also a growing body of evidence pointing to the fact that high-performing systems connect research, policy, and practice in coherent, aligned, and dramatically effective ways (Leanna 2011; Reynolds 2010). Their success is the result of thorough research, careful policy selection, rigorous planning, and the systematic realization of policy into practice.

Only by assessing whether an intervention has been properly implemented with fidelity can policy makers, researchers, and practitioners ever hope to gain a better understanding of how and why that intervention works, and the extent to which the desired outcomes can be achieved. This is part of an implementation science that explains the success of certain education systems while others continue to struggle. Singapore and Hong Kong have practiced, shaped and refined this implementation science over many decades, and it is this precision of delivery that will ensure that the exceptional performance of both education systems is sustained.

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