



Title	Explaining the success of the world's leading education systems: The case of Singapore
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EXPLAINING THE SUCCESS OF THE WORLD'S LEADING EDUCATION SYSTEMS: THE CASE OF SINGAPORE

ABSTRACT: International comparative data on student performance has led McKinsey&Company, among others, to suggest that education systems will inexorably converge in their developmental trajectories with principals and schools enjoying more autonomy. This article challenges these assumptions through referencing Singapore where schools and professionals are still tightly controlled in key resources, curricula and assessment, and where other key factors contribute to its success – thereby evidencing multiple pathways to success.

Keywords: Singapore education, teacher and principal professionalization, autonomy

INTRODUCTION

Comparative research on school effectiveness has received intense scrutiny following the barrage of published studies comparing the performance of education systems in different parts of the world (Barber & Mourshed, 2010; Mourshed, Chijioke, & Barber, 2010; OECD, 2013a). McKinsey&Company, for example, in a flurry of highly publicized reports, has attempted to map out commonalities in the developmental trajectories of education systems around the world ([Barber & Mourshed, 2007, 2010](#); Barber, Whelan, & Clark, 2010; Mourshed, Chijioke, & Barber, 2010). Undoubtedly, this trajectory has had the effect of reducing the insularity of school educational processes that have traditionally escaped the attention of analysts and scholars, and has consequently led to greater educational transparency, collaboration, and diffusion of best practices among policy makers and schools in different countries.

However, an argument can also be made that in the process, some researchers have adopted a somewhat reductionist, analytical approach in their endeavor to identify supposed commonalities and generic characteristics of a development trajectory across all education systems, thereby ignoring pertinent sociocultural, political and other contextual features that have underpinned and impacted the development of education systems in different countries (Walker & Dimmock, 2002). Consistent with this premise, this paper centers on Singapore, a much lauded high-performing education system (Darling-Hammond, 2012; OECD, 2013b) to illustrate the inherent divergence of the city-state's developmental trajectory vis-a-vis those of other improving education systems as classified in the typology of most improved education systems by McKinsey&Company (Mourshed, Chijioke, & Barber, 2010).

Since the early 1990s, school reforms have focused on giving schools greater autonomy over a wide range of institutional operations in an effort to raise performance levels (Whitty, 1997; Carnoy, 2000; Clark, 2009; Machin and Veroit, 2011). More decision-making responsibility and accountability have devolved to school principals, and, in some cases, management responsibilities have devolved to teachers or department heads. Schools have become increasingly responsible for curricular and instructional decisions as well as for managing financial and material resources and personnel. These reforms are adopted on the premise that schools themselves are more knowledgeable about their own needs and the most effective ways to allocate resources and design the curriculum so that they can better meet the needs of their students.

Our argument is not that Singapore, unlike other developed education systems, has defied the trend towards devolution and autonomy; rather, it is about the degree to which it has followed this trend, and the diverse means by which the Singapore Ministry of Education (MOE) has managed to maintain control in the process of granting limited autonomy to schools and principals. It is also about the need to consider a host of other factors that account for a high-performing education system. A glance at the world's leading systems reveals that Singapore is not alone in this respect and that a range of complex diverse responses are detectable, resulting in different degrees and forms of autonomy, as well as a coterie of disparate but influential factors on performance. In short, it is apparent that there are multiple pathways to success.

Evidence for this claim, specifically in relation to Singapore, is found in the Program for International Student Assessment (PISA) 2012 data (OECD, 2013c). These data show that while Singapore is second only to Shanghai in mathematics performance, it is below the Organization for Economic Cooperation and Development (OECD) average for school autonomy overall (OECD, 2013c, p.51). Specifically, it is

significantly below the OECD average for school autonomy and resource allocation (OECD, 2013c, p.131), and for school autonomy and curricula and assessments (OECD, 2013c, p.132). Table 1 below shows school autonomy in Singapore relative to selected other systems.

Insert Table 1 here

UNIVERSAL DEVELOPMENTAL TRAJECTORY?

According to the McKinsey&Company typology, twenty of the most improved education systems around the world are classified as belonging to one of four distinct stages of development, and inexorably progressing from one stage to another (Mourshed, Chijioke, & Barber, 2010). First, education systems in the least performing stage – from *poor to fair* – are reported to be focused on supporting students to achieve basic levels of literacy and mathematics, by providing support for lowly skilled teachers, meeting basic student learning needs, and elevating all schools to minimum quality thresholds.

Education systems belonging to the second stage of development – from *fair to good* – devote their energies and resources to consolidating system foundations, by generating high quality system-wide performance data, introducing teacher and school accountability measures, and generating organizational and pedagogical models. In the third stage of development (from *good to great*), education systems work on ensuring the professional status of school teachers and principals via the implementation of informed practices and clear career paths. Education systems in the fourth and last stage - from *great to excellent* – shift the locus of improvement from the center to schools

themselves. Educators learn with peers within and across schools, and participate in system-sponsored innovation and experimentation.

The McKinsey&Company typology asserts unequivocally that across the four stages of development, education systems have developmental trajectories that are invariant across different contextual backgrounds:

‘What our analysis reveals is that despite their different contexts, all improving school systems appear to adopt a similar set of interventions that is appropriate to their stage of the journey. This is not to say that context is not important, but it is secondary to getting the fundamentals right’ (Mourshed, Chijioke, & Barber, 2010, p. 17).

In the typology, only Finland qualifies to be placed in the highest stage, while Singapore is classified as belonging to the ‘good to great’ stage. Singapore earns the status of a ‘sustained improver’ by virtue of its cumulative and consistent rises in student achievement spanning multiple data points (1983 to 2007) and subject areas (reading, mathematics, science). However, according to PISA 2012 results (OECD, 2012), Shanghai had eclipsed Finland in terms of mathematics, reading and science, and the top seven places were by then occupied by East and South-east Asian countries, including Singapore, Hong Kong, Taiwan and Korea. The domination of Asian systems is noteworthy, and in just a short time (2009-2012) McKinsey&Company’s classification of Finland as the world’s only excellent system, seemed inappropriate if not misleading.

The allusion from McKinsey&Company, however, is that the Singapore education system exhibits most, if not all, of the developmental characteristics of other

similarly improved systems in the same stage, and is predicted to manifest even those of Finland as it continues on its improvement journey. These characteristics comprise first, the expected professionalization of teachers and principals, and second the staged decentralization of decision-making from the center to school level. This ‘truism’ according to McKinsey&Company occurs invariably as follows:

‘Systems on the poor to fair journey... exercise tight, central control over teaching and learning processes in order to minimize the degree of variation between individual classes and across schools. In contrast, systems moving from good to great... only provide loose, central guidelines for teaching and learning processes, in order to encourage peer-led creativity and innovation inside schools, the core driver for raising performance at this stage’ (Mourshed, Chijioke, & Barber, 2010, p. 34).

Further evidence of a generic correlation between high performance and the loosening of centralization is given by the PISA 2012 results (OECD, 2013c), the report on which asserts that the ‘highest-performing school systems are those that allocate educational resources more equitably among advantaged and disadvantaged schools and that grant more autonomy over curricula and assessments to individual schools’ (p. 4). However, as noted elsewhere in this paper, the correlation does not hold for Singapore.

We contend that these assumptions are unnecessarily unequivocal, and without due regard for the broader socio-cultural and political contexts of different societies, including the present case of Singapore. As previously stated, according to PISA 2012 results (OECD 2013c), the top seven places in performance in mathematics, reading and

science are all Asian (Shanghai, Singapore, Hong Kong, Taiwan, Korea, Macao, and Japan), while the next five places are European (Liechtenstein, Switzerland, Netherlands, Estonia and Finland). It is readily apparent that there is as much variation in education systems within each of the Asian and European clusters, as there is between them – in terms of school organization and governance, and centralization and autonomy. This leads us to the conclusion that there are multiple pathways to becoming a top performing system. Claims of generalized characteristics across all systems as they progress to the top are thus vulnerable to the criticism that they are oversimplifications and fail to take into account the unique complexities of culture and context that characterize each system in its development trajectory (Dimmock & Walker, 2005).

Criticisms of ‘naïve empiricism’ that are angled towards the McKinsey&Co. reports, can also be leveled at those emanating from OECD PISA reports and TIMSS. ‘Naïve empiricism’, according to Juslin, Winman and Olsson (2000), consists of two elements; first, overconfidence - sometimes verging on dogmatism - in conclusions based on empirical data; and second, the ‘hard-easy’ effect, which refers to the oversimplification or reductionism of complex phenomena. In the present context naïve empiricism has both of these elements. First, the use of a narrow range of scores on a set of tests to represent a much larger phenomenon of student learning outcomes – for example, with PISA, scores for mathematics, science and reading on an international achievement test, which are then assumed to represent a much broader-based concept of student learning outcomes. Although McKinsey&Co uses more sources of student achievement data (including TIMSS and PISA) than does PISA, all these data are still quantitative snapshots. There are no qualitative data on student learning and growth. Hence the use of such test scores fails to adequately capture the complexity of student learning and development. Second, both McKinsey&Co. and PISA tend to simplify the

attributions of education system success to a misleadingly small number of factors. That is, they simplify the implications and attributions of such scores to relatively few factors, such as school autonomy and teacher professionalism, when multiple factors within and without school account for a system's performance. A further elaboration of these criticisms is, thirdly, that although PISA collects data on student, family, and school variables, neither McKinsey&Co nor PISA take sufficient account of socio-cultural factors in their explanation of school success. For example, broader socio-cultural contextual variables that influence student school performance – such as race/ethnicity, diversity in classrooms and schools, parenting processes, socio-economic environment and resource equity (eg. class size, types of programme offered, compensatory education, and social mobility) - are ignored. Finally, although the McKinsey study relies on qualitative and quantitative data, and PISA exclusively on quantitative survey data, both adopt a cross-sectional research design. Thus inferences of causality may be inappropriate if not misleading.

Our argument on the dangers of naïve empiricism is well illustrated by the unique contexts of two South-East Asian systems - Singapore and Vietnam. In Singapore's case, over the short period of 50 years, it has risen from a Third World, port-based British colony to a First World independent republic whose economy has one of the highest per capita incomes in the world (Gopinathan, 2007). During this period it has transformed itself into a stable political entity (although described as a democracy, one party has monopolized power since the nation state became an independent republic in 1965), built a trusted global banking and financial sector, diversified its economic structure, and created a harmonious, loyal citizenry from a previous divided ethnic and linguistic population, the size of which has increased five-fold to 5 million people

(Gopinathan, 2007). Having participated in PISA testing since 2009, it was rated by OECD to be the top education system globally in 2015 (Coughlan, 2015).

In comparison, Vietnam, also an impressive performer in PISA tests, has a communist government, and a large population of 90 million. Unlike Singapore, its fast economic growth rate began only a decade ago, and until 2012, it had not participated in international achievement tests. Unlike Singapore, poverty in both rural and urban areas is significant. Yet, entering the PISA tests for the first time in 2012, Vietnam was ranked a high 16th out of 61 participant countries. – a higher ranking than England, Germany and the USA – and 12th in 2015 (Coughlan, 2015). As a recently emergent economy and society, where governance is still heavily centralized, and improved teacher professionalism is an aspiration for the future, Vietnam's PISA performance suggests a highly successful school system. Yet, Vietnam's 'success' is apparently due to three factors (Coughlan, 2015): high government commitment to investing in education (more than 21 per cent of Government expenditure went to education in 2010), to hard working students and teachers, a high degree of centralized control of schools, where, for example, the Government designed a curriculum focusing on deep understanding and mastery of core skills, and to high levels of teacher dedication and status in society. However, others suggest many other contributory factors, for example, a high drop-out rate among weaker students prior to eligibility for PISA, leaving only the most able to be tested (The Economist, 2013). Singapore and Vietnam – both high performing systems on PISA tests, illustrate that while having some features in common (such as strong centralization), each has a distinctly different range of contextual factors accounting for their respective success.

In the sections that follow, our analysis systematically unravels the particular contextual conditions underlying the educational development of Singapore. It compares

the status quo - as evidenced by the PISA 2012 results (OECD 2013c) - with the scenario depicted in the typological assumptions espoused by McKinsey&Company (2010). The analysis is themed according to professionalization of teachers; professionalization of principals, their values and mission; and central control – all in relation to autonomy. In succeeding sections, we go on to explain the complexity of factors that *de facto* explain Singapore’s pathway to success. Singapore constitutes an example of how each country forges its own pathway, leading to the conclusion that there are multiple pathways to success.

PROFESSIONALISM OF TEACHERS, THE CURRICULUM AND AUTONOMY

The professionalization of teachers refers to the latter’s perceptions of their professional status and rewards as seen by themselves and other members of society (Hargreaves, 2000). It entails expectations of quality in the work produced, appropriate professional conduct, and elements of autonomy in the professional work done (Helsby, 1995; Larson, 1977). According to Hargreaves (2000), teachers if deemed to be professionals, should earn substantial and competitive salaries, resist public discourses that blame teachers for student underachievement, regulate the certification of teaching staff in schools, acquire state-of-the-art pedagogical knowledge, focus collaborative energies on improving teaching and learning, spend time on collaboration in daily school life (in addition to after-school or vacation provisions), and collaborate with colleagues within and across schools.

When teachers in the Singapore education system are matched against these criteria, they do appear to have achieved professional status (MOE, 2014). More specifically, Singapore teachers are recruited from the top one-third of the cohort of school graduates. While in England, there is a teacher shortage, in Singapore, there are

eight applicants for every teacher training position (Crehan, 2014). Singapore teachers receive salaries that are competitive with equally well-qualified civil servants in other government ministries, and they are benchmarked with those of similar qualifications and job responsibilities in the private sector. There is society-wide respect for the teaching profession in Singapore. The pre- and in-service training programs that teachers undergo are of high quality and benchmarked internationally. Within and across schools, there are structured provisions to facilitate teacher individual and peer collaboration (e.g., sponsorship for postgraduate courses, professional learning communities, network learning communities and subject chapters across schools, structured mentoring) (MOE, 2014). Unquestionably the biggest indicator of the importance placed on teacher professional development is the requirement introduced by the Singapore MOE in 2010 that every school become a professional learning community (PLC), that every teacher participate and engage in their own and colleagues' learning, and that all principals take responsibility for leading and managing their PLCs (Academy of Singapore Teachers, 2012). Singapore teachers are given ample opportunity to experience high levels of professional growth.

However, beyond these largely structural but important provisions, teachers in most Singapore schools do not appear to enjoy a high degree of autonomy in the exercise of their professional practice. More specifically, within classrooms, they can theoretically choose their preferred teaching approaches from an array of competing pedagogical options, but they lack flexibility to tailor the curriculum or assessment to suit their students' needs (Dimmock, 2011; Gopinathan & Deng, 2006). This is because curricular tracks are largely predetermined in the centralized Singapore education system, from subject-based banding in primary schools, to academic/technical tracks in secondary schools and post-secondary institutions (MOE, 2015). More importantly,

MOE perceives the existing national curriculum to be well developed and fit-for-purpose, and therefore any school-based curriculum is seen as complementary to, rather than as substitute for, the national curriculum (Gopinathan & Deng, 2006), and is largely confined to early primary years and the co-curriculum. Furthermore, in contrast to the McKinsey&Company model of ‘school-based curriculum enactment’ (p. 99), Singapore teachers’ roles are largely restricted to interpreting, reorganizing, and restructuring the given curriculum, as opposed to reinventing a more individualized curriculum to suit their students’ needs (Gopinathan & Deng, 2006). The main curtailment to teacher professional autonomy, however, is the pressure exerted by the MOE for Singapore students to maintain their position as top performers on PISA and other international tests, and the equal pressure by parents for students to gain entry to higher education and the best universities. These two forces lead to the perpetuation of teacher over-reliance on didactic teaching methods at the expense of student-centered teaching and learning. Hogan and Colleagues’ (2009) system-wide research (see Table 2 below) on Singapore teaching shows the dominance of traditional forms of pedagogy at the expense of the introduction of new strategies. Summarizing, Hogan and Colleagues’ (2009) data prove that teachers in Singapore rely on whole class forms of lesson organization, with whole class lectures and question and answer sequences characterizing 60% of all lessons in both Primary 5 and Secondary 3. This pattern is quite different from the dominant forms of classroom organization in the West: in Britain for example, more than half of all lessons are organized around group work activities.

Insert Table 2 here

Convincing evidence confirms that didactic teaching, rote memorizing and testing are closely aligned with high performance on international achievement tests, compared with student-centered methods (Hattie, 2009).

In recent years, schools are encouraged to provide non-academic niche programs such as sports, uniform groups, visual and performing arts (Dimmock, 2011). If these niche programs have an academic character, they must complement rather than supplant the mainstream prescribed academic curriculum. This caveat is most evident in the then Education Minister Teo's exhortation that in the context of centrally prescribed programs and parameters in Singapore, schools can only 'decide on implementation, like further customization and implementation of non-academic school programs' (MOE, 1999, p.5). There are however two groups of schools that enjoy greater autonomy in curricular development, funding, and governance (i.e., the independent schools, and specialized independent schools in mathematics and science, science and technology, arts, and sports), but their number is small as a percentage of the entire system, with schools enjoying little curriculum autonomy (Dimmock, 2011).

In the domain of assessment, students in Singapore schools are exposed to multiple nation-wide high-stake summative examinations at key learning stages that are carefully designed for the purposes of allocating them to different academic tracks based on their demonstrated abilities (Tan, Chow, & Goh, 2008). These examinations include the Gifted Education Program screening in primary 4, Primary School leaving Examination in primary 6, GCE 'O' levels in secondary 4 or 5, and GCE 'A' levels in junior colleges. These different institutional constraints collectively impinge on teachers' professional autonomy in the key areas of curriculum and assessment, and exert pressure on the development of their identities as empowered professionals (Day, Kington, Stobart, & Sammons, 2006).

Overall, the relatively low level of autonomy granted to Singapore schools for curriculum and assessment is evidenced in the PISA 2012 data (OECD, 2013c, p.132) and summarized in Table 1. These data, based on the perspectives of principals, teachers, and administrators, show Singapore below the OECD average for school autonomy over resource allocation and for curriculum and assessment.

PROFESSIONALIZATION OF PRINCIPALS AND AUTONOMY

With regard to the professionalization of principals, a review of the extant literature indicates that principal leadership in Singapore has not been systematically researched (Ng et.al, 2015a). Rather, Ng and colleagues (2015a) found a total of 37 papers, theses and reports that referenced principal leadership. The review provides *prima facie* evidence of relatively high levels of principal leadership professionalism in Singapore. First, the appraisal and selection process for career advancement to principalship is rigorous and based on recommendation from superiors rather than self-selection. In a small centralized system of 360 schools, every teacher, middle-level and senior leader is regularly appraised and the attributes of each become well acknowledged among those responsible for promotion. Second, Ng and colleagues' (2015) literature review emphasizes the fact that every aspiring leader goes through the same leadership training programs for middle leaders, and again later when aspiring to principalship – resulting in a uniformly high standard of system alignment. Both programs are monopolized by the National Institute of Education (NIE), The program for aspiring principals – known as the Leaders in Education Program – LEP - is run over 6 months full-time, and includes extensive reading, project work in a school, visits overseas, and mentorship. Less than half of the deputy principals completing the LEP are selected for principalship. Few systems invest this level of resource in training future

principals. However, in order to examine the degree of professionalism that principals in Singapore schools actually enjoy in practice, it is necessary to identify first, the key behavioral attributes of school leadership and second, the decision-making context in which their leadership is enacted.

In terms of principal attributes, Bush and Glover (2014) – writing from a distinctly Anglo-American and thus ethnocentric perspective - assert that despite the proliferation of different conceptual paradigms, few would challenge that -

‘school leadership is a process of influence leading to the achievement of desired purposes. Successful leaders develop a vision for their schools based on their personal and professional values. They articulate this vision at every opportunity and influence their staff and other stakeholders to share the vision. The philosophy, structures and activities of the school are geared towards the achievement of this shared vision’ (p. 5).

Inherent in this articulation is the compelling notion that principals ground their vision in clear personal and professional values, and that they assertively influence their organizational members to collectively achieve their vision (Day, Harris, & Hadfield, 2001; [Southworth, 1993](#); Yukl, 2002). The ultimate stage is reached where schools become ‘self-organizing’ (Bain, 2007; [Bain, Walker & Chan, 2011](#)), with minimal intervention from government, and where school leaders (and teachers) enjoy substantial autonomy in resource allocation to undertake and sustain capacity building from within (Dimmock, 2012; Dinham & Crowther, 2011; King & Bouchard, 2011). In short – ubiquitous school-system evolutionary development is predicated on a professionally-led model of school system evolutionary development (Hargreaves, 2011). This appears

to be the conceptualization underpinning the progressive stage-by-stage trajectory recognized and espoused by McKinsey&Company (Mourshed, Chijioke, & Barber, 2010). This scenario seems remote from the everyday experiences of most Singapore principals, as explained below.

Singapore Principals, Values and Mission

Rhetorically, according to MOE (2008), principals of Singapore schools are expected to be transformative agents who can equip students with the knowledge, competencies, and skills that are needed for the desired future. In particular, they are to be guided by sound values and a sense of purpose, to be able to inspire others to realize a shared vision, to grow teachers and other school staff, and to lead and manage change. The in-service training for all prospective principals is concentrated at, and monopolized by NIE, where programs espouse the development of capabilities in participants to handle complexities involved in the mission of equipping students with twenty-first century attributes (Ng, 2013). Toward this end, aspiring principals learn how to envision the future, contextualize theories to suit local needs, adapt to emerging contingencies, and collaborate with others.

However, the reality for principal leadership practice is that they are largely circumscribed in the definition and articulation of their professional values (Dimmock & Tan, 2013). Indeed, they are expected to adhere more to MOE's corporate values and vision, as expressed for example in a proliferation of MOE policy documents, including the Desired Outcomes of Education policy, than develop their own personal and professional values (MOE, 2008). For example, they are required to consider the implications of education to nation-building (e.g., national cohesion) and to prepare students for the workforce (e.g., the knowledge-based economy) that the government

envisions will benefit Singapore. Many values that are deemed to be sacrosanct in the Singapore education system such as meritocracy, use of examinations, bilingualism, use of English as the primary medium of instruction, and the secularity of schools emphasizing racial and religious harmony are also enshrined and systematically reinforced in policy articulations such as ‘Thinking Schools, Learning Nation’, ‘Desired Outcomes of Education’, ‘Philosophy for Educational Leadership’, and ‘Ethos of the Teaching Profession’ (Tan & Dimmock, 2014). Consequently, there is little room for alternative schooling models such as schooling for religious or purely epistemic ends that do not appear to benefit the nation more than either sectoral or individual student interests. Expectedly, principals ‘gradually begin to integrate their own personal and professional identities with MOE’s values, thereby internalizing the latter as their own, adopting them as a kind of “default” position for undergirding their leadership practice over time’ (Dimmock & Tan, 2013, p. 331). Further evidence on the degree to which the professionalism of Singapore principals is circumscribed, comes from clarifying the degree to which, and ways in which, the MOE exerts central control over schools. We discuss this below.

CENTRAL CONTROL AND AUTONOMY

Scholars of Singapore education have recently described the relationship between MOE and schools in dialectical terms. Tan and Ng (2007) for example, report that Singapore, like other developed systems, has (since 1997 in particular), introduced major educational change to prepare its students to meet the challenges of a knowledge economy. They go on to discuss recent educational change in Singapore using the framework of decentralized-centralism, first proposed by Karlsen (2000). In exploring the dynamics of change in the initiation, content, levels and simultaneity of the reform

process in terms of ‘decentralized-centralism,’ Tan and Ng (2007) describe the ideological roots of the decentralized-centralism policy as the tension between functionalist and liberal forms of education in the Singapore context.

Recently, Chua (2014) refers to Singapore’s unique emergent system of governance as centralized-decentralization (reversing Tan and Ng’s terminology). Chua argues that while strong central decision making has been credited for Singapore’s high performance on international tests such as PISA and Trends in International Mathematics and Science Study (TIMSS), concerns were raised about the degree of responsiveness and innovation that such a centralized system could support, especially when trying to shift schools to focus on 21st century skills. Consequently, he says, the Ministry started to give bounded autonomy to schools to make local decisions. For example, under the ‘*Teach Less, Learn More*’ (TLLM) initiative, designed to reduce the over-reliance on rote learning and encourage schools to develop learning experiences that engage students, promote critical and creative thinking and support students’ holistic development, schools were given more flexibility to develop their own pedagogical approaches (e.g., inquiry or problem-based learning) as long as these approaches were aligned to the intent of TLLM. MOE also created ‘white spaces’ in the curriculum for schools to develop their own unique courses and learning programs. It has to be said, however, that these are mostly confined to the co-curriculum area. Since that time, the Ministry has pursued other policies that reflect a centralized-decentralized approach. For many years, according to Chua (2014), Singapore maintained relatively large class sizes of 40 students per teacher. However, when MOE decided to reduce class sizes, it did not dictate a particular size for all classes. Rather, it created a new matrix of student-teacher ratios that determined the overall allocation of teachers to schools, but left schools with the flexibility to determine the optimal class size for

different kinds of students. Thus some schools have chosen larger classes for higher ability students and smaller for lower achievers (Chua, 2014).

That there is less centralization today than in the 1970s and 1980s is recognition that some decision making is best made in the schools by principals and teachers – since they know local conditions best. However, as Chua goes on to say, just as the flip side of some carefully calibrated increase in autonomy is increased accountability for results, from the Ministry's perspective, centralized guidance (such as the parameters of schools' student-teacher ratios) is needed to maintain coherence as a system. Chua (2014) argues that ultimately, the approach is designed to enable the system to reap all the benefits associated with tight coupling and a strong central authority without overly constraining the local professional class, and thus depriving the system of innovation and creativity. In the end, however, making centralized-decentralization work, may well depend on the professionalism and capacity of superintendents and school leaders to resist rote compliance and learn how to make local adaptations that do not stray too far from policy makers' expectations. This last is peculiarly Singaporean. And as later discussed, the system of 360 schools is small enough to allow MOE and school leaders to believe that it can still be strongly controlled, if not micro-managed, from the center.

If principals of Singapore schools may be said to operate in an environment characterized by relatively low levels of devolution of decision-making capacities from the center (i.e., MOE) to schools, the line of authority from MOE is organized around four geographical zones and then school clusters within the zones. The four zones are led by deputy directors, who work closely with a middle-tier (i.e. cluster superintendents) to advise and support principals. Decision-making power on school operational matters is delegated to principals. However beyond local operational issues, principals enjoy bounded autonomy in that they have to ensure that the overall developmental trajectory

of their schools, in terms of student learning outcomes, curricular offerings and assessment, staff development and appraisal, resource management, and relationships with community stakeholders, is tightly aligned to that of MOE (Tan & Dimmock, 2014). They have to regularly report to MOE on how their schools contribute to the larger vision espoused by MOE, and therefore they do not enjoy devolution of decision-making power over the directions of their schools, arguably the most pertinent requirement of an archetypical decentralized and highly performing system. Teachers are allocated to schools by MOE, and the large part of school budgets is also allocated to them. Thus principals enjoy little if any control over three main resources essential to their performance – curriculum, teacher selection and appointment, and finance (Dimmock & Tan, 2013). Furthermore, the PISA 2012 data (OECD, 2013, p.131) confirm that Singapore schools and principals are placed below the OECD average for school autonomy for use of resources and resource allocation.

Consequently, a convincing case can be made that the real locus of strategic decision-making resides in powerful bureaucrats in MOE headquarters. Hence compared with other high-performing school systems - Victoria (Australia), Netherlands, Taiwan, and Hong Kong (all of which are above the OECD average) – Singapore principals have their powers seriously circumscribed in their professional roles and responsibilities. Although enjoying more latitude than in past decades, principals are still functioning as line managers (they are still classed as MOE ‘officers’ instead of ‘professionals’) under tight supervisory and monitoring conditions, ensuring the efficient implementation of the center’s policies. It is this characteristic - the capacity to devise and efficiently implement pragmatic policies.- that Gopinathan (2007) claims is the prevailing culture that pervades the whole system; it has been the transformative lever propelling Singapore’s development.

This fundamental relationship between MOE headquarters and schools has evolved but not substantively changed over time (Gopinathan, 2007; Gopinathan & Deng, 2006; Gopinathan, Wong, & Tang, 2008; Mourshed, Chijioke, & Barber, 2010; Tan & Dimmock, 2014). In the earlier phases of Singapore's educational development (survival phase: 1959-1978; efficiency phase: 1979-1996 – see Gopinathan, 2007), MOE has employed various centralized approaches such as policy mandates, curricular and assessment standardization, managerialism for principals, leadership handbooks, and standard operational procedures - in the formulation and implementation of policy. In the present phase of development (ability-driven phase: 1997-present), MOE has continued to exert strong control, albeit more subtly, over schools' leadership, direction and development. These more nuanced control strategies include supplanting top-down bureaucratic instructions with pro-MOE self- and peer-sanctions; controlling behaviors via the articulation of espoused national, corporate, and professional values; and implementing the cluster system to provide an intermediary between MOE and schools (Tan & Dimmock, 2014). The emergence of these more subtle, and less explicit MOE's steering mechanisms, together with persistent and repetitive MOE's policy rhetoric have, we contend, been misinterpreted by McKinsey&Company and others, as evidence that the locus of control in Singapore schools is significantly switching from MOE to school level

In summary, the continued overwhelming influence of MOE has separately led scholars such as Tan and Ng (2007) and Ng (2010) to describe Singapore as having 'centralized' decentralization (p. 284), and Tan and Dimmock (2014) to characterize Singapore's educational governance as 'steering... from close proximity' (p. 757). In view of the bounded professional autonomy exercised by principals and teachers in an otherwise tightly controlled policy environment, the lingering question is - 'how then

does Singapore achieve its phenomenal educational success?' Expressed differently, are there other factors that explain the sustained excellence of the Singapore education system more authentically than McKinsey&Company's generic emphasis on autonomy, self-managing schools and professionalism?

EXPLAINING SINGAPORE'S EDUCATIONAL SUCCESS

In addressing the above question, it is important to note that there are myriad factors spanning the macro (social, economic, cultural environments), organizational (schools and classrooms), and familial (parenting and socialization practices) contexts that contribute to Singapore's exceptional student academic success (Dimmock & Tan, 2013). In the Singapore context, the following contributors to its success are particularly noteworthy.

Competent Policymakers

First, the Ministry prescribes explicit and consistent values and priorities that it expects system- and school-level leaders to adopt. MOE policymakers and bureaucrats have been widely acknowledged to be competent, pragmatic, and innovative, rather than remote, complacent or ideological (Tan, 2011; Tan & Dimmock, 2014). They are keenly aware of the latest international trends in educational reform research and best practice, and this knowledge is instrumental in informing the continuous improvement of the education system.

Tight Coupling

There is also very tight coupling within the Singapore education system, made possible by the logistics of a small system, congruent human resource policies, and a

social compact premised on paternalism, which is only recently under considerable stress due to rising inequality and the democratization of information on social media (Dimmock & Tan, 2013). More specifically, the small size of the Singapore system comprising approximately 360 schools (all of which are large, averaging 1500 pupils) enables policies, backed by abundant resources due to the booming Singapore economy, to be implemented efficiently across schools. Indeed, Singapore per capita student spending is only US\$5,000-6,000 (in purchasing power parity terms), remarkably lower than that incurred by other high-performing systems, such as Hong Kong and Ontario (Mourshed, Chijioke, & Barber, 2010).

Second, there is a plethora of policies that are propitious to overall system coherence and effectiveness (Tan, 2011). These policies include the delineation of clear career tracks for principals vis-a-vis teachers, an appraisal system that rewards principals according to specified criteria, consensual views of currently estimated potential of leaders at all levels of the system, leadership preparation and development by a monopolist institution (NIE), between-school rotation of principals, a cluster structure helmed by superintendents, who are experienced principals and who mediate between MOE headquarters and schools, and continuous and repetitive articulation of clear values that underpin education policies and leadership (Tan & Dimmock, 2014).

Indeed, it can be argued that these myriad policies serve to foster the alignment between MOE policies, school visions, and teachers' goals (Ng, 2013; Ng, Wong, Choy, & Nguyen, 2014; Nguyen & Ng, 2014). More specifically, principals are cognizant of the imperative to incorporate MOE teaching-learning policies and initiatives in their own school vision. Ng's (2013) research found that Singapore principals defined cornerstone MOE policies in teaching-learning and overarching initiatives (e.g., TLLM) in their definition of their school vision. In the words of a principal interviewed in Ng

and colleagues' (2014) study of instructional leadership in Singapore and other Asian countries, he had to "first and foremost ... take direction from MOE, followed by ... school board ... and parents and students."

Further evidence of how Singapore principals' leadership remains tightly circumscribed by the MOE is provided by Ng, Nguyen, Wong and Choy (2015b). These authors emphasize that the MOE still has a stringent process in place for identifying and training all aspiring and experienced school leaders and principals. Furthermore, the alignment between school leadership and MOE policy is most evident in two dimensions – school vision and managing the instructional programme. In relation to developing school vision, 'Singapore principals ... frame school goals based on.....initiatives and policies from the MOE, ..such as Teach Less Learn More, and 21st century competencies' (Ng et al., 2015b, p.394). Singapore principals articulate their visions for their schools and exercise instructional leadership, but always within the frameworks of national goals espoused by the government, and education policies prescribed by the MOE (Ng et al., 2015b, p. 402). Even an area of decision making that one would normally expect to be school-based – such as, re-balancing teaching methods in schools from teacher- to student-centred – is strongly framed and monitored by the MOE in its policies such as Teach Less, Learn More. The MOE still plays a very active role in influencing how principals exercise their school leadership.

To ensure the further cascading of MOE policies to teachers, principals ensure that teacher appraisal is based on how they contribute toward the fulfilment of these policies. Results from a system-wide study of principals in Singapore (Nguyen & Ng, 2014) showed that compared to other survey items on principals aligning teaching-learning to school visions, school middle managers ($n = 686$) found it difficult to agree to survey items stating that principals discussed or evaluated their teaching practices

with respect to the school vision. This finding led Nguyen and Ng (2014) to argue "... that the criteria for teaching performance evaluation could be more skewed toward fulfilling national initiatives rather than local school indicators..." (p. 10). Put together, this alignment between the center, principals, and teachers eventuates in an efficient, and feasibly effective, implementation of MOE policies.

Third, importantly, these policies are enacted within the context of a paternalistic social compact where policymakers epitomize moral values in order to gain respect and deference from principals, and promote collegial cultures in schools (Tan & Dimmock, 2014). In such a context, principals are more willing to conform and face 'correction' for unsatisfactory behavior as perceived by bureaucrats and policymakers. In fact, the moderating effects of this social compact can be argued to extend beyond the education system to the larger Singapore society, where reciprocal relationships and accountabilities undergird the nexus of relationships among politicians, bureaucrats, and citizens (Ho, 2003). The bureaucracy is perceived to be effective and knowledgeable, and therefore legitimate. As a consequence of the system being perceived as 'de-politicised', there are high levels of adherence and deference by principals.

Sociocultural Premium on Achievement

A further source of influence that is commonly acknowledged to have contributed to the educational success of Singapore is its Confucian heritage. More specifically, as in many other Confucian heritage cultures, the predominantly Chinese society of Singapore values learning and academic achievement above other more hedonistic pursuits. Most parents invest enormous time, energy, and resources in nurturing the academic capacity of their children (Bray, 2007; Cheo & Quah, 2005). Many of them enroll their children in out-of-school private tuition or enrichment classes.

Results of a survey conducted by The Straits Times (the mainstream English language newspaper in Singapore) showed that an overwhelming majority (97%) of students from different educational levels (primary, secondary, and junior college levels) and of different abilities (failing or achieving) received coaching from either private tutors or tuition centers (Toh, 2008, June 15). Furthermore, at least two-thirds of students engaging in additional tuition reported that they benefited from and even enjoyed the extra-class lessons.

Parents commonly regard private tuition as a necessity (Toh, 2008, June 15) and some schools expect students to receive such private tuition outside school (MOE, 2012). There are even signs of an increasing number of parents enrolling their nursery or kindergarten children in enrichment or tuition classes (Toh, 2008, June 15). The growing significance of the 'shadow education industry' in Singapore is corroborated by the results of the nationwide Household Expenditure Survey 2012-2013 recently conducted by the Ministry of Trade and Industry (MITI; 2014). More specifically, the results showed that families in present Singapore spent S\$1.1b yearly on tuition, representing nearly double the S\$650m spent a decade ago. The average household expenditure on tuition is now S\$80 monthly compared with S\$55 monthly a decade ago (Tan, 2014, November 9). To-date, there are a total of 850 tuition centers registered with the MOE in Singapore (Tan, 2014, November 9). Tuition centers are also more sophisticated in their offerings, catering to students of different abilities and needs. There are even tuition centers focusing on niche areas such as preparing children to be selected for the highly selective and coveted MOE Gifted Education Program (designed for the most cognitively endowed students), and for entry into elite secondary schools via the Direct Admission Scheme (designed for academically outstanding students with specialized competencies and skills).

There is also a trend of parents procuring tuition services for very young children in Singapore. For example, a study of low-income parents of kindergarten children (Frewen, Chew, Carter, Chunn, & Jotanovic, 2015) found that two-thirds of them enrolled their children in after-school enrichment (mostly academic) or formal tuition classes. Half of these parents rated academic achievement as the most important, as compared to social or physical development, for their children. Another one-third of parents rated academic achievement to be at least as important as social or physical development.

Many mothers quit their full-time jobs in order to spend time coaching or monitoring their children's learning in primary schools. In addition, the emergence of community self-help groups affiliated to each of the four dominant races in Singapore provides further testimony of intensive educational support (e.g., low-cost tuition) to students (Bray, 2007). In schools, teachers are preoccupied with promoting academic achievement in their students, leading to emerging concerns of overtaxing students with excessive homework (MOE, 2012). Principals and policymakers also place a premium on academic pursuits in the larger scheme of holistic education. For example, the Education Endowment Scheme was launched in 1993 to provide annual grants to each school and each student of school-going age to support the latter's participation in educational programs.

On another plane, MOE actively seeks the involvement of parents to support student learning (MOE, 2012). To-date, there are many resources to facilitate parent involvement in their children's education - the Parents in Education website providing parents with resources on parenting tips, educational news, and parent learning; funds for schools to use to collaborate with parents; a Partnership Resource Pack for schools; and structured platforms for parents to network and share best practices. These myriad

investments to foster parent collaboration in enhancing students' academic achievement is undergirded in the primordial belief that in an island devoid of natural resources, human talent represents the only productive factor that can be developed to ensure the nation's continuing viability (Han et al, 2011; Neo & Chen, 2007). Consequently, there is a system-wide assumption that students need to have strong academic foundations, complemented by twenty-first century competencies and skills, to afford them productive careers in the knowledge-based economy.

This proactive and deliberate parent engagement strategy appears to be well-informed as there is some evidence that students in Singapore schools benefit from learning-centered home and parent resources (Chen, 2014; Stright & Yeo, 2014). For example, a study of 5041 fourth graders from 177 Singapore schools found that students had higher mathematics achievement if they had more books and if they spoke more of the test language (English) at home (Chen, 2014). Another study (Stright & Yeo, 2014) of 712 third to sixth graders from nine Singapore schools found that students whose parents engaged more with teachers on specific learning issues had higher overall school achievement. The same study also reported that children of outwardly affirmative parents who were involved in their children's schooling (e.g., via attending or supporting school events) had higher overall school achievement.

CONCLUSION

The present analysis highlights the unique socio-economic-political circumstances that contextualize the Singapore education system and that account for its somewhat different developmental trajectory from the otherwise ubiquitous path some analysts claim to recognize for education systems on their track towards excellence. In this sense Singapore fails strictly to conform to the McKinsey&Company model that

recognizes an inexorable path towards a progressive principal- and teacher- (that is, professional) autonomy leading towards school self-direction. International comparative studies, such as the McKinsey&Company and OECD PISA reports, have claimed that education systems progressing towards and achieving excellence will inexorably devolve significant powers of decision-making from the center to schools, and that the locus of innovation will emanate more from principals and teachers in an empowered professional fraternity than from system-mandated changes.

It should not be forgotten that between 1956 and the mid-1970s, Singapore was in danger of being classified a 'failed state', divided ethnically and linguistically, a faltering port-based economy, and a segmented education system. Political control and legitimacy - achieved through sustained economic growth – plus the establishment of a sound education system - were the required policy responses (Gopinathan, 2007). It may be conjectured that many other states (eg.in the Middle East and Africa) might benefit from the Singapore model.

In this paper, we have not only challenged this assumption, but have elaborated on how, despite the relatively high degree of central control from MOE, albeit nuanced, and the lack of opportunity for principals and teachers to exercise high levels of professional discretion over curriculum and assessment and resource allocation – despite their high degree of professionalism - Singapore students have continued to exhibit comparatively high levels of academic achievement. In the analysis, we have argued that a unique combination of competent system direction and strategic leadership, tight coupling of the Singapore education system, and sociocultural premium on achievement have seemingly ameliorated the structural limitations associated with a tightly controlled system, and have coalesced to contribute to the outstanding levels of student achievement. Conceptualized in Giddens' (1979) agency-structure framework, structural

constraints imposed by MOE curtail the professional autonomy and agency that principals in other more decentralized systems might exercise, according to the McKinsey&Company's typology. Furthermore, perhaps because of the compactness and tight coupling between stakeholders inherent in the Singapore education system, principals in Singapore find it challenging to harness the social capital that might arise from their collegial relationships with other peers in the fraternity to moderate the impact of these structural constraints (Bolden, Petrov, & Gosling, 2008).

While the system functions efficiently and effectively at present, there are lingering questions however, as to whether this containment of the professionalism of principals will adversely impact their sense of professional identity in terms of their self-image, self-esteem, self-efficacy, job motivation, task perceptions, and career expectations (Kelchtermans, 1993), or whether their presence within a highly regarded world leading system will in some way compensate. A further question is whether the prevalence of strong central control – a model best suited to an industrial economy, a stage which Singapore left as it entered the 21st century, is capable of delivering the post-1997 reforms, including the desired levels of creativity and innovation spread widely across the educated population of Singapore as it sustains its status as a knowledge-based economy (Ng & Tan, 2006). Does such a post-industrial society necessitate an education system where principals are not fearful of taking necessary initiatives to improve student learning – even when such opportunities exist - without clear approval from the center (Hallinger, Taraseina, & Miller, 1994)? Critics also argue that the status quo also portends risks of leadership conformity, homogeneity, parochialism, and inflexibility; tension with the cultivation of teacher leadership; and difficulties with overall leadership renewal towards a more diverse school leadership cadre better suited to a global, competitive world (Dimmock & Tan, 2013; Walker &

Dimmock, 2002). The potential ramifications of these multiple risks and challenges on student learning and achievement warrant deliberation among the powerful bureaucrats in MOE on the developmental trajectory of professionalism and governance in the Singapore education system. To date, it appears that Singapore has forged its own trajectory or pathway, like other systems of education, seeming to defy the generic trajectory whereby the world's leading education systems inexorably depend for their high performance and progressively follow a path towards more school-led, self-directed and professionalized policy making and practice. Whether Singapore will continue along its unique path of education governance will depend on its ability to continue to provide a workforce equipped with the skills needed by a dynamic knowledge-based economy, its capacity to produce a loyal citizenry, both of which ultimately depend on whether it can successfully restore levels of social mobility and equity that its people think are fair.

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PROFESSIONALISATION AND SCHOOL AUTONOMY

Table 1
OECD School Autonomy Index (adapted from OECD, PISA 2012 Database)

	← More school autonomy			→ Less school autonomy		
	UK	Hong Kong	OECD Average	Shanghai, China	Singapore	Vietnam
Over resource Allocation	+1.2	+0.4	0	-0.3	-0.4	-0.5
Over curriculum & assessment	+0.9	+1.0	0	-0.6	-0.25	-1.0

Criteria used to measure principals', teachers' and regional/natural administrators' perceptions of autonomy over (a) resource allocation: hiring and firing teachers, deciding teachers' starting salaries, deciding teachers' salary increases, formulating the school budget, allocating school budget; (b) curriculum and assessment: establishing student assessment policies, choosing textbooks, determining course content, deciding which courses to offer.

PROFESSIONALISATION AND SCHOOL AUTONOMY

Table 2

Lesson Structure by Level (Classroom Observation Data)

Primary 5 (Rank ordered)	% of Phases	Secondary 3 (Ranked ordered)	% of Phases
Whole class answer checking / IRE	27.6	Whole class lecture/ Monologue	32.0
Whole class lecture/ Monologue	20.5	Whole class answer checking / IRE	22.0
Whole class elicitation and discussion	6.3	Whole class elicitation and discussion	6.2
Whole class demonstration/ Activity	3.3	Whole class demonstration/ Activity	2.7
Choral repetition	3.0	Choral repetition	1.4
Subtotal	60.7	Subtotal	62.3
Individual work	18.3	Individual work	17.6
Small group work	12.1	Small group work	10.2
Student demonstration	5.2	Student demonstration	5.2
Test-taking	1.6	Test-taking	1.6
Laboratory/ Experiment	2.2	Laboratory/ Experiment	1.1
Total	100	Total	100
Number of lessons	591	Number of lessons	578

Source: Hogan and Colleagues (2009)