

Organizational Legitimacy of the Singapore Ministry of Education in a Knowledge-Based Economy

This paper analyzes the perceived organizational legitimacy of the Singapore Ministry of Education (MOE) in preparing the population for work in the knowledge-based economy (KBE). It is argued that challenges to MOE's legitimacy are emerging with ramifications that are difficult to ignore. These challenges relate to equipping the population with KBE attributes and developing diverse forms of talents in students. To maintain organizational legitimacy, education authorities need to work more closely with stakeholders to develop forward-looking learning eco-systems in schools where teaching is professionalized, assessments are responsibly leveraged, student talents are nurtured, and external stakeholders are involved.

Keywords: legitimacy; education; knowledge-based economy; Singapore

Introduction

Education in Singapore has grown in tandem with the city-state since independence in 1965 to become a world-class system admired by policymakers worldwide (Barber, Whelan, & Clark, 2010; Mourshed, Chijioke, & Barber, 2010). In its developmental trajectory, education has been the primary policy tool for preparing the workforce to meet the nation's economic needs and elevating the population from poverty to middle-class status (Apple, 2004; Gopinathan, 2007). Indeed, Castells (1992) asserted that the Singapore government 'establishes as its principle of legitimacy its ability to promote and sustain development, understanding by development the combination of steady high rates of economic growth and structural change in the productive system' (p. 56). There are high levels of efficiency in resource allocation and usage, and impressive returns to investment in education (Barber & Mourshed, 2007; Mourshed, et al., 2010). Most importantly, Singapore students have consistently outperformed peers from other advanced economies in international comparative assessments.

However, beneath the façade of accolades, questions on the effectiveness of its education system in meeting the population's aspirations for economic success in the new economy – so-called knowledge-based economy (KBE) - have surfaced (P. T. Ng, 2010). The

labour market in Singapore, as it is the case in many other developed economies, is undergoing structural changes (Bhaskaran et al., 2013). First, due to labour substitution, there is evidence that skilled workers enjoy higher earnings than unskilled and semi-skilled workers, and that their earnings increase with experience faster than less skilled peers in Singapore. Second, job polarization means that there is increased demand for skilled workers, whilst middle skilled jobs are supplanted by technological advances, thereby contributing to median wage stagnation in the city-state. Lastly, top performers (e.g., top 1-2%) are rewarded handsomely, whilst middle performers only enjoy modest rewards, and average workers do not see significant economic rewards. These structural changes give rise to many questions to be addressed. Can the centrally planned Singapore education system, whose policies are formulated by the Ministry of Education (MOE), continue to meet the country's economic needs? Can it continue to be a lever for social mobility? Can it accommodate the diverse aspirations of the population so that individuals with different talents can derive economic dividends from their talents? These are hard questions that have culminated in a tension that is progressively threatening the legitimacy of MOE in Singapore. Accordingly, the aims of this paper are first, to discuss different sources of tension threatening the organizational legitimacy of MOE, and second, to outline strategies that can be undertaken by MOE to maintain its organizational legitimacy. The discussion is divided into three sections. The first section discusses the role of education in economic development in Singapore. The second section reviews the literature on organizational legitimacy and explores the relevance of this concept to the Singapore education system in the context of the KBE. The third section focuses on how MOE has attempted to maintain the legitimacy of the Singapore education system as the primary government agency preparing students for the KBE and the challenges it encounters. The last section outlines strategies that MOE and schools can undertake to maintain organizational legitimacy in the light of these challenges.

Education for economy

As in many countries, education policies in Singapore are notably designed to support the nation's economic growth and development - enabling citizens to find jobs and improving their material well-being (Apple, 2004; Gopinathan, 2007; Heng, 2011). Indeed, a review of Singapore's education trajectory reveals that the economic impetus always presages education policies (Ashforth & Gibbs, 1990; Han, 2009; Ho, 2003; J. Tan, 2007). For example, after achieving independence in 1965, Singapore had to build its economy from scratch, abandon its hope for a common market in Malaya following separation from Malaysia, and cope with the impending withdrawal of British forces in 1971 and the oil crisis of 1973. There were high levels of unemployment among its largely unskilled population. Consequently, the broad goals of the Singapore government during the survival-driven phase of educational development (1965 to 1978) were to educate the population swiftly and build a disciplined and cohesive society.

By the late 1970s, Singapore's concern shifted to how efficiently the education system could meet the needs of the economy in the efficiency-driven phase of educational development (1978 to 1997). At that time, the system was accused of failing to produce the talents and skills regarded as necessary for a high quality workforce to support a vibrant capital-intensive, high value-added manufacturing industry (K. S. Goh & Education Study Team, 1979). There was also additional impetus for educational improvement as Singapore experienced its first economic recession since independence in 1986. Consequently, the primary goals of education policies at that time were to reduce performance variation system-wide and improve the quality of education in all schools.

Then in 1997, educational developments in Singapore entered a new phase – the ability-driven phase - with the declaration of the nationwide vision of Thinking Schools,

Learning Nation (TSLN) by then Prime Minister Goh Chok Tong (C. T. Goh, 1997). Thinking Schools emphasized a more process-focused learning environment in schools, while Learning Nation underscored the culture of lifelong learning beyond formal schooling. Bolstered by the onset of the Asian Financial Crisis in 1997, TSLN represented a de facto affirmation of the impact of the KBE on education policies and the urgent imperative to reform education in the city-state. As Singapore finds itself increasingly reliant on technology- and knowledge-driven industries emblematic of its emergence as a KBE (Dimmock & Goh, 2011), it becomes increasingly apparent that Singapore is gradually transforming into a KBE. Indeed, various authoritative studies have rated Singapore very highly vis-à-vis other economies on its relative success toward becoming a KBE (e.g., 23rd/145 economies in Knowledge Economy Index (2012) by World Bank, 3rd/141 economies in Global Innovation Index 2012 by INSEAD and World Intellectual Property Organization, and 2nd/142 economies in Global Competitiveness Report (2011-2012) by World Economic Forum) (Dutta, 2012; Schwab, 2011; The World Bank, 2012).

The relative success of Singapore in transiting from the survival to efficiency, and then to ability-driven stage of educational development is facilitated by the unique characteristics of the Singapore governance system (Dimmock & C. Y. Tan, in press; C. Y. Tan & Dimmock, in press). The education system in Singapore is tightly coupled, where MOE is placed in charge of all primary schools, secondary schools, and postsecondary institutions. School curriculum, pedagogy, and assessment in schools is centrally designed and highly synchronised in support of national economic needs, including preparing the population for the KBE (Heng, 2012). MOE, as with all other ministries in Singapore, is helmed by a political appointee (education minister) who has the benefit of senior government bureaucrats' (permanent secretaries) counsel and expertise. These senior bureaucrats typically serve in a ministry for a few years before being rotated to another

ministry within the civil service. This provides a source of continuity in terms of policymaking. Furthermore, the ruling political party's – People's Action Party (PAP) – dominance as the main political party in Singapore's parliament since independence means that the government is able to provide an additional source of stability in policymaking (Ho, 2003; Neo & Chen, 2007). As would be discussed later, the dominance and continuity of the PAP in government means that many of Singapore's education policies dovetail with, and support national priorities of the government.

Legitimacy of MOE

With administrative efficiency and the requisite political will, MOE has been able to fulfil its role in providing universal education to the population. In turn, this has fostered social mobility in the city-state (Ng, 2011). For instance, the proportion of citizens aged 25 to 39 who had completed at least secondary school education rose almost fourfold from 25% in 1980 to 96% in 2010. This translated to the attainment of educational levels of at least one level above that of their parents for Singaporeans who were born in 1970s/1980s. Another set of statistics showed that the top 5% of grade 6 students who had sat for the mandatory national examination (Primary School Leaving Examination or PSLE) hailed from 95% of all primary schools and from all socioeconomic backgrounds. Between 1990 and 2010, of students in the bottom third socioeconomic bracket, about half scored within the top two-thirds of the PSLE cohort and one-sixth scored within the top one-third. The improvements in overall educational levels enabled the population to find skilled jobs and contribute to the nation's economic development, thereby enabling the Singapore education system to maintain its organizational legitimacy.

However, it may be argued that challenges to the system's legitimacy followed the onset of the KBE in the late 1980s (Harris, 2001). During that period of time, the world

experienced a global economic recession and developed economies started to experience economic slowdown, ballooning budgetary deficits, and declining real incomes. In the endeavour to identify novel sources of competitive advantage, scholars, governments, and businesses believe that the recession heralded the beginning of the third industrial revolution where economic wealth would be produced through the creation, distribution, and consumption of knowledge-based products powered by intellectual capabilities. Knowledge once created contributes to productivity and accumulates as economic capital. Consequently, it is not subjected to the economic law of diminishing returns. This yields the potential of fuelling perpetual economic growth for advanced economies whose labour costs and capital investment returns have become increasingly uncompetitive.

In the process, Singapore, like many other advanced economies, becomes increasingly reliant on the mobilization of knowledge to create sources of competitive advantage for its economy (Dutta, 2012; Schwab, 2011; The World Bank, 2012). Concomitantly, evidence of worsening income inequality and mobility in society also began to emerge in recent years (MTI, 2011; I. Y. H. Ng & Rothwell, 2009). Indeed, according to the Singapore national census conducted in 2010, the Gini coefficient remained moderately high in 2009 (0.471) and 2010 (0.472). Even when ameliorating social policies like government handouts and taxes were taken into account, the Gini coefficient only improved marginally to 0.452 in 2010 (MTI, 2011). Furthermore, based on estimated earning elasticities computed from the National Youth Survey, Ng and Rothwell (2009) contended that intergenerational social mobility in Singapore was markedly lower than that in most developed economies. They acknowledged that universal education had contributed to the levelling up of Singaporeans en masse, but cautioned that it 'may not have been as effective as an agent of intergenerational mobility' since 'most of the returns from schooling seem to derive from parents' economic status' (p. 20). Understandably, the increasing difficulty of citizens to move up the social

ladder may undermine the perceived economic value of education. This in turn threatens the perceived legitimacy of MOE as the key lever for contributing to the nation's socioeconomic development through the provision of education.

Organizational legitimacy

To understand the emerging state of affairs, it is necessary to first briefly review the notion of organizational legitimacy in the sociological literature. According to Maurer (1971), organizational legitimacy, being hierarchical and explicitly evaluative, is important as it is 'the process whereby an organization justifies to a peer or superordinate system its right to exist' (p. 361). On the other hand, Dowling and Pfeffer (1975) underscored the 'congruence between social values associated with or implied by organizational activities and the norms of acceptable behaviour in the larger social system' in organizational legitimacy (p. 122). Adopting a somewhat similar cultural conformity perspective, Meyer and Scott (1992) argued that organizational legitimacy is about 'the degree of cultural support for an organization – the extent to which the array of established cultural accounts provide explanation for its existence, function, and jurisdiction' (p. 201). These diverse perspectives lead Suchman (1995) to contend that organizational legitimacy is a 'generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions' (p. 574).

Premised on this definition of organizational legitimacy, it appears that an organization achieves legitimacy when its means and ends conform to prevailing social norms, values, and expectations (Ashforth & Gibbs, 1990; Dowling & Pfeffer, 1975). In view of normative pressures, efficiency and performance are not sufficient to earn an organization, or to let it maintain, its legitimacy. Rather, legitimacy can only be conferred upon the organization by its constituents (Ashforth & Gibbs, 1990; Perrow, 1970). Suchman (1995)

poignantly described legitimacy as a perception that represents a reaction of observers to the organization as they see it. Thus, organizational legitimacy is possessed objectively, yet created subjectively. Even if an entity has obtained organizational legitimacy status, changes in its social environment would still require that it continues to manage its legitimacy diligently.

In view of the salience of legitimacy, it is not surprising to find the literature replete with articulations of various types of organizational legitimacy and how organizations can manage them. In particular, two types of legitimacy are especially relevant in educational contexts – cognitive and socio-political legitimacy (Aldrich & Fiol, 1994). First, cognitive legitimacy is derived from the ability of organizations to understand the environment. According to Scott (1994), cognitive legitimacy refers to ‘widely held beliefs and taken-for-granted assumptions that provide a framework for everyday routine, as well as the more specialized, explicit and codified knowledge and belief systems promulgated by various professional and scientific bodies’ (p. 81). Consequently, individuals may take an activity – existing or new - as a given when they become acquainted with it. However, when change occurs, they are more likely to scrutinize the organization if the latter has incomplete knowledge of cause-effect relationships or technology, or if it lacks clear output standards (Ashforth & Gibbs, 1990). Understandably, founders cannot simply convince others to follow their directives in the absence of tangible evidence that such a change will pay off. Under such circumstances, it is important that organizations symbolically manage legitimacy so that individuals can be convinced that the new activity is now part of an emerging reality that they have to embrace, and that there are substantial benefits to be reaped (Aldrich, 2008; Aldrich & Ruef, 2006; Scott, 1994; Suchman, 1995). Consequently, change will be more likely to be accepted and the organization can be said to have achieved cognitive legitimacy in the process.

The second type of organizational legitimacy is socio-political legitimacy which comprises moral and regulatory acceptance. Moral acceptance is a judgment on whether an activity undertaken by an organization is indeed ‘the right thing to do’ (Suchman, 1995, p. 579). It is not contingent on judgments about whether the activity benefits the evaluator (Aldrich & Fiol, 1994; Hunt & Aldrich, 1996; Scott, 1977; Scott & Meyer, 1991; Suchman, 1995; Zimmerman & Zeitz, 2002). On the other hand, regulatory acceptance is related to organizational conformity with government rules and regulations.

Maintaining organizational legitimacy - cognitive and socio-political – then represents a strategic consideration for MOE implementing various initiatives to prepare students for effective functioning in the KBE. Equipping students with the qualities needed in the KBE contributes toward MOE realising its mission (Heng, 2012). As Meyer (1977) suggested, ‘education functions in society as a legitimating theory of knowledge defining certain types of knowledge as extant and as authoritative’ (p. 66). This function of education is as relevant in the labour- and capital-intensive economy of yesteryears as it is in the present KBE. It can be argued that MOE will be conferred new legitimacy and power as an institution entrusted by society to prepare students for the KBE insofar as education policies are successful in equipping students with the requisite attributes for, and bringing students’ diverse creative potentials to fruition in, the context of the KBE (Boulding, 1978; Richardson, 1985; Suchman, 1995). The ‘liability of newness’ (Aldrich & Fiol, 1994; Stinchcombe, 1965; Suchman, 1995; Zimmerman & Zeitz, 2002) inherent in new education policies designed to prepare students for the KBE means that MOE must persevere to maintain its organizational legitimacy in a perceivably new, hostile socio-political environment (Aldrich & Fiol, 1994; Meyer & Scott, 1983; Stinchcombe, 1965). Moving forward, the progress of MOE in maintaining organizational legitimacy will be discussed in the next section. It deserves mentioning that as education initiatives aimed at preparing the workforce for the KBE

emanate from and are aligned to MOE's policies, there is little doubt on the grip on regulatory legitimacy that MOE is currently enjoying. Hence, the discussion will be focused on cognitive and moral legitimacy, and exclude regulatory aspects of legitimacy. Furthermore, the discussion will focus on MOE's legitimacy as perceived by parents-at-large, who constitute the largest group of stakeholders whose children are receiving education in schools, and whose future socioeconomic wellbeing will conceivably be most impacted by the advent of the KBE. The analysis of perspectives of other stakeholders (e.g., school leaders and teachers) will not be analysed in this paper.

Maintaining legitimacy

MOE's endeavours to prepare students for the KBE are encapsulated in the overarching TSLN policy, and supporting mission statement, Desired Outcomes of Education (DOEs), and Curriculum 2015 framework adopted by all schools system-wide. These initiatives guide the formulation and implementation of various specific innovations introduced at different levels of the education system. Given the salience of these initiatives, the discussion will now briefly review their role in MOE's endeavours to address the nation's KBE needs.

First, the TSLN policy is primarily designed to equip students with competencies and skills needed in the KBE (P. T. Ng, 2008b). The overarching aims of TSLN are to develop thinking skills, passion for lifelong learning, and civic consciousness in all students. Realization of these aims necessitates a shift from content mastery to acquisition of values, competencies, and skills. Numerous initiatives have been introduced by MOE in support of TSLN. These include National Education, Information Technology Master-plans designed to enable technology-facilitated teaching and learning, Ability-Driven Education catering to students' different learning needs and interests, and Innovation and Enterprise (I&E) inculcating a mind-set for continuous improvement and learning in students. TSLN is

reinforced by MOE's mission (Moulding the Future of Our Nation), DOEs summarizing the aims of holistic education, and the Teach Less, Learn More (TLLM) initiative aimed at getting educators to reflect on 'why', 'what', and 'how' they teach (Gopinathan, 2005; P. T. Ng, 2008a; Sharpe & Gopinathan, 2002). In particular, the DOEs have been articulated since 1997 and updated in 2009, and they explicate desired learning outcomes for students at different stages of education (primary, secondary, and post-secondary). As for TLLM, in the 'why' of teaching, teachers are exhorted to nurture the passion for learning in all learners, and teach for understanding. As for the 'what' of teaching, they have to focus on the whole child, inculcate values, emphasize the process of learning and encourage questioning from students. In the 'how' of teaching, they have to promote engaged and differentiated learning, play a facilitative role in student learning, leverage on more formative assessments, and encourage a mind-set of I&E (P. T. Ng, 2008a). In realizing the DOEs in TSLN, MOE sponsors a raft of curricular innovations across schools (Dimmock, 2011; Gopinathan & Deng, 2006). Primary and secondary schools are empowered to develop their own niche programs. Specialist schools catering to needs of secondary students with non-academic interests are started. Outstanding secondary schools can exempt their top students from the 'O' Level examinations so that more time can be used for learning instead of preparing for assessments (Gopinathan & Deng, 2006).

More recently, MOE has explicated more succinctly what terminal learning outcomes students should demonstrate in the Curriculum 2015 framework (MOE, 2011a):

- confident persons who can differentiate right from wrong, are adaptable and resilient, have self-awareness, make good judgments, think independently and critically, and communicate effectively;
- self-directed learners who take personal responsibility for their own learning, are questioning, are reflective, and who persevere in learning;

- active contributors who as effective team players, display initiative, take calculated risks, are innovative, and pursue excellence; and
- concerned citizens who feel a sense of belonging to Singapore, are civic-minded, and strive to improve others' well-being.

Accompanying these desired outcomes are a set of core skills that MOE deems to be essential for the KBE, namely information and communication skills; civic literacy, global awareness, and cross-cultural skills; and critical and creative thinking (MOE, 2010a). These skills rest on socio-emotional learning competencies of self-awareness, self-management, social awareness, relationship management, and responsible decision-making; and core values of respect, responsibility, integrity, care, resilience, and harmony. It is interesting to note the congruence between many of these learning priorities and sacrosanct values espoused by the Singapore government. For instance, the government has continuously emphasized national education, including racial and religious harmony, since the nation's independence, and this national-level pursuit of civic consciousness and societal harmony has percolated through different government policies pertaining to housing, citizen military service, civil service, media, and education (Han et al, 2011). For education in particular, pursuit of terminal outcomes like 'concerned citizens', 'social awareness', 'relationship management', 'respect', and 'harmony' attest to the government's primordial concerns. Therefore, it can be argued that in maintaining the organizational legitimacy of the MOE, design of the national school curriculum is also motivated by the desire of government leaders to preserve and promote national viability.

To enable students to proactively plan for their future careers, MOE launched the Education and Career Guidance (ECG) initiative in 2009 (MOE, 2011b). The ECG is a developmental process aimed at enabling students to understand their interests, skills, values,

and strengths; motivating students to learn by relating their studies to future career aspirations; equipping students with the capacity to make informed career decisions; and developing qualities of proactivity, adaptability, and resilience needed in the KBE. Students undergo different phases in the ECG, spanning career awareness, exploration, and planning at the primary, secondary, and upper/post-secondary levels respectively.

Apart from initiatives aimed at equipping students with values, competencies, and skills needed to thrive in the KBE, MOE also facilitates work attachment opportunities for teachers in order to broaden the latter's perspectives and create new learning experiences. This professional development for teachers is expected to translate into more quality, varied, and relevant learning experiences for students (MOE, 2010b). Similarly, MOE supports schools in overseas learning trips for students and teachers to understand other cultures and ways of life, network with foreign educators and students, and conduct exchange programs. In fact, it goes to the extent of specifying the target proportion of students from different schooling levels who should have an opportunity to visit another country. This cross-cultural exposure and learning sensitizes students to the diversity that they may be experiencing in their future workplace.

i) Cognitive legitimacy

The discussion illustrates that MOE has endeavoured to transform teaching-learning in schools in response to the exigencies of the KBE. It may be argued that education policymakers in Singapore are seeking to maintain its organizational legitimacy. For instance, despite its admirable educational achievements for students who have benefited under its policies, MOE has positioned itself to be continually looking out for macro changes in the KBE workplace and adjusting its policies on teaching-learning accordingly. It has also reminded its constituents that records of high achievement averages should be safeguarded

(Lee, 2006). This is yet another example of how the Singapore government, cognizant of the nation's dependence on its only resource – its citizenry - attempt to maintain Singapore's competitive advantage predicated on a disciplined and well-educated workforce (Han et al, 2011). It may be argued that MOE has endeavoured to maintain its cognitive legitimacy by promulgating comprehensible models depicting an ambiguous world of work. Specifically, MOE has attempted to explicate desired outcomes of education for the KBE and prepare students to realize these outcomes. This has the effect of addressing stakeholders' trepidation by the provision of concrete, comprehensible models engineered to explain the unknown world of work, thereby maintaining cognitive legitimacy (Scott, 1991). It merits mentioning that there is very little research conducted to empirically examine competencies and skills needed in new jobs created in the KBE (Morris & Western, 2005; Powell & Snellman, 2004). Nonetheless, it is reasonable to assume that the KBE requires individuals who can add value to firms and organizations (Harris, 2001). Consequently, those who acquire and demonstrate their repertoire of capacities are in demand, receiving gainful employment and premium wages. Conversely, those who fail to prove their worth fall behind in the economic race. The resultant skills and income divide between the academically and non-academically endowed has the potential to contribute to socioeconomic inequality, especially in a KBE (Gopinathan, 2007).

ii) Moral legitimacy

By shaping society's normative expectations of the nature of work in the KBE, MOE is also attempting to hold on to its moral legitimacy. More specifically, the increasing reference made to the availability of career options in the real world of work signals a search for legitimacy from beyond the education system. These initiatives appear to be 'the things' that schools should responsibly be doing to allay parents' anxiety for their children. They are also

indicative of the expectations of the populace for the government to take the lead in addressing their needs in different areas of their lives (Ho, 2013) – what Teo (2011) pithily described as neoliberal morality in Singapore. Unsurprisingly, policymakers of developed economies elsewhere are also aligning their education and economic policies to accommodate the burgeoning demands of the KBE. Indeed, there is also a growing consensus among different countries and organizations that workers need to be equipped with certain values, competencies, and skills in order to contribute optimally in the KBE (Ashton & Green, 1996; Brown & Hesketh, 2004; New Commission on the Skills of the American Workforce, 2006; OECD, 2001; Rooney, Hearn, & Ninan, 2005; United States National Research Council, 1999). For instance, The New Commission on the Skills of the American Workforce (2006) promulgated that the workforce needs to be equipped with academic, thinking, and workplace competencies for effective functioning. While some academics may debate on the role and efficacy of schools in equipping students with qualities needed in the KBE (Tuomi-Grohn & Engestrom, 2003), it is a widely held view that a labour force with high levels of education, competencies, and skills is essential in creating and sustaining knowledge creation and application (Ashton & Green, 1996; New Commission on the Skills of the American Workforce, 2006; Thurow, 2000; United States National Research Council, 1999). An examination of MOE's Curriculum 2015 framework reveals a close congruence with those articulated by many other education authorities elsewhere in the world (Ananiadou & Claro, 2009) This convergence provides MOE with further support for its moral legitimacy.

MOE has also tried to maintain its moral legitimacy by decentralizing and encouraging diversity within the education system (C. Tan, 2011). Tharman, then Minister-of-Education in 2004, professed that the government aims to reduce the emphasis on examinations, focus on holistic education, and provide students with more choices in their

studies (Tharman, 2004). Indeed, the education landscape is undeniably more varied now. There are top-performing schools offering the Integrated Program where the academically outstanding can bypass the GCE 'O' Levels at Secondary 4 (age 16), thereby freeing time to engage in more high-level learning, before sitting for the GCE 'A' Levels or International Baccalaureate at age 18. There are also three specialized schools established that cater for customized instruction in sports, arts, or science/mathematics. Secondary school principals also enjoy more autonomy to admit students who may not be academically outstanding but who possess specific skills that can contribute to the building of particular niches in their schools. Even in primary schools, there is more flexibility in the combination of subjects that students can opt for at higher grade levels. The diversity introduced into the education system enables more students to develop their talents and pursue myriad interests. This helps to maintain MOE's moral legitimacy, and arguably addresses the electorate's desire for more diversity and greater socio-political liberalization (George, 2013).

Challenges to legitimacy

i) Convincing stakeholders of the existential reality of KBE

Despite attempts to achieve its mission, MOE has to address challenges in the cognitive and moral legitimacy domains. For cognitive legitimacy, MOE has to address three pertinent issues pertaining to the KBE (Ball, 2008). First, it has to convince the citizenry that students have to be prepared for the new reality of KBE instead of the old industrial economy. In this new economy, value is created through knowledge production and application. Second, MOE has to rationalize how schools can effectively prepare students to work in the KBE. A related question is whether learning in schools should be motivated by economic reasons instead of the intrinsic desire to learn and improve (Allais, 2012). Given Singapore's multiracial, multi-religious characteristics, would the social fabric be compromised in the long term if the

curriculum emphasizes economic viability instead of social cohesion? Third, MOE has to be cognizant of social inequalities that may accompany the transformation toward a KBE. For a start, MOE has failed to clarify what it means for schools to nurture diverse talents in students. Given the longstanding emphasis placed on academic achievement, Singapore schools may find it difficult to reach a consensus on what constitutes non-academic excellence. Without this common understanding, schools cannot fulfil their taken-for-granted allocative function in channelling students to meaningful and productive careers aligned to their talents and interests in life. If different talents are not given due emphasis and development in schools, students with non-academic talents may not be able to generate economic value from their talents and be successful in the KBE. Hence, the inability to explicate precise definitions of alternative talents casts doubt over MOE's cognitive legitimacy.

ii) Resistance to change

In addition to challenges to cognitive legitimacy, MOE also has to contend with issues confronting its moral legitimacy. This is due to MOE's reluctance to radically change and align the way teaching, learning, and assessment takes place normatively in the school (Brown & Lauder, 2001; P. T. Ng, 2010). This inertia is at least partly attributable to the government's desire to maintain Singapore's high levels of overall educational achievements vis-à-vis other nations and the overwhelming use of examination results to stream students in the education system (Appold, 2001). In particular, there exists a conspicuous mismatch between the quest for content mastery – as assessed through high-stake examinations - and the ongoing holistic emphasis on values, competencies, and skills (Gopinathan & Deng, 2006; P. T. Ng, 2008b; C. Tan, 2011). This resistance has percolated throughout Singapore society with teachers teaching to the test, students using rote-learning to excel in

examinations, and parents expecting their children to focus on contents learning (Hogan & Gopinathan, 2009). Recently, this national obsession with high-stake academic examination has even prompted the Education Minister to commission a systemic review of the usage of examinations (Wong, 2011). This impending review is timely, given that the use of academic achievements to certify educational effectiveness in a KBE is inadequate as success premised on knowledge creation and intelligent application requires more than pen-and-paper tests to be effectively measured (P. T. Ng, 2010).

Other education policies also need to be refined to moderate the overwhelming focus on academic achievement. For instance, the coveted pinnacle awards that schools can compete for under the Master-plan of Awards require schools to have outstanding student academic performance as an all-important prerequisite, among other non-academic achievements (McKenna & Richardson, 2009). The academic assessments, that matter to the majority of students for entry to top schools, remain little influenced by the introduction of alternative assessments in schools. In fact, students even need to have relatively good academic results if they aspire to enter specialist schools that promise an alternative curriculum. The overwhelming emphasis on academic achievement precludes energies and resources that can otherwise be devoted to nurture non-academic talents in students.

iii) Teachers' readiness level

Threats to MOE's moral legitimacy may also arise from factor associated with teachers. First, many teachers contribute to the lack of success in equipping students with requisite KBE attributes because they may be merely learning state-of-the-art pedagogies and then applying them in class, instead of actively practising the very KBE skills that they need to teach their students – for instance, information, communication, and thinking skills (C. Y. Tan, 2012). Without role-modelling and experiencing what is needed in KBE work environments, it is

difficult for teachers to impress upon their charges the need to acquire new competencies and skills or to teach the latter these attributes. Teachers' inadequacies, coupled with the failure of teaching, learning, and examinations to change to be more aligned with KBE-related values, competencies, and skills, culminates in a threat to MOE's moral legitimacy in its endeavour to prepare students for the new economy.

Another reason contributing to MOE's erosion of moral legitimacy can be attributed to teachers' lack of pedagogical knowledge and skills to identify students' non-academic needs, preferences, and talents; to develop these talents; and to evaluate students' achievements in these domains (Gopinathan & Deng, 2006). Many schools are struggling to find a balance in catering to students' non-academic interests and implementing the mandated academic curriculum. Finally, most teachers may be ill-equipped to advise students on alternative non-academic career pathways. All these inadequacies hinder schools from responding effectively to the need to nurture students' diverse interests, thereby adversely affecting stakeholders' perceptions of MOE's moral legitimacy in nurturing different talents for the KBE.

Proposed solutions

In the face of diminishing organizational legitimacy in preparing the population for the new economy, MOE and its schools could transform themselves from being insular bastions of contents learning to forward-looking learning ecosystems that are cognizant of external trends (e.g., KBE) and attendant implications for student learning (C. Y. Tan, 2012). This transformation requires the alignment of curriculum, pedagogy, assessment to be consistent with KBE attributes and that give students room to develop their diverse talents. Student learning will benefit from the use of technology-enabled platforms, inquiry-based approaches, and group work. Understandably, this transformative teaching and learning

necessitates visionary, learning-centred school leadership (Dimmock & Goh, 2011; Gopinathan, Wong, & Tang, 2008). For instance, MOE could support teachers' design of innovative pedagogies that address student profiles, and integrate KBE competencies and skills, and participation in action research examining the efficacy of these strategies. Teachers' familiarity with KBE competencies would help to enhance their own readiness in embracing the KBE, and by extension, their competence in preparing their charges for the KBE across schools in the entire system. Next, if assessments signal what is deemed to be important (Y. K. Tan, Chow, & Goh, 2008), then MOE and schools could identify critical competencies and skills that students should have, design curriculum that delivers these areas, and use both formative and summative assessments to support student learning in these areas. This strategy would leverage on the hitherto normative use of assessments to validate important outcomes, and in this case, sanctioning the value of KBE competencies and skills. This contributes to the moral legitimacy of MOE in the KBE. Third, MOE could support schools in identifying talents in students and designing programs to grow these talents (Heng, 2012). This systemic intervention would address the difficulty that many schools may face in identifying and developing alternative, non-academic talents in students, thereby removing another impediment in the way of MOE achieving moral legitimacy. Beyond the school, MOE and schools could involve different stakeholders in their strategic planning and curricular designs (Khong & Ng, 2005), or send teachers and students on industrial attachment with knowledge-based organizations. This exposure helps to shape educators' mental models and inform instructional leadership and practice (MOE, 2010b). This contributes to the cognitive legitimacy of schools in being enlightened institutions familiar with the demands of the new economy. This strategic co-option of different players helps schools to be more responsive to stakeholders' needs, thereby making schools 'default' institutions for preparing students for the KBE in the minds of parents.

Conclusion

More than four decades ago, sociologist Henry Levin argued that educators are accountable to society in reviewing the legitimacy of education in improving the life of all individuals (Levin, 1974). Although society has progressed dramatically since then, it is argued in this paper that the issue of organizational legitimacy of education continues to be at least as, if not more, salient in today's socioeconomic context driven by the imperatives of the KBE as it was in the past. Taking cognizance of education as 'a set of institutional rules which legitimately classify and authoritatively allocate individuals to positions in society' (Meyer, 1977, p. 59), this paper has discussed how education policymakers in Singapore attempt to define and sanction what are deemed to be critical attributes students need for the KBE, and the relative neglect of the development of alternative forms of non-academic student talents in Singapore schools. The examination of MOE's organizational legitimacy is timely (P. T. Ng, 2010), even when there is longstanding endorsement of education for economic development for the city-state, perceived educators' passivity in the centrally-controlled Singapore education system, contribution of education to improvement of livelihood of Singaporeans, and perennial preoccupation of educators with implementing an endless barrage of new initiatives in Singapore schools.

School leaders and teachers, as much as MOE, have an important part to play in addressing challenges to the legitimacy of MOE and schools, particularly in response to the 'liability of newness' (Freeman, Carroll, & Hannan, 1983, p. 692; Stinchcombe, 1965, p. 148) attributable to the advent of the KBE. In this respect, the solution to solving societal problems may not rest in either supplanting schools altogether with alternative educational arrangements – what Illich (1971) termed 'de-schooling' – or relegating the responsibility conveniently to society at large. Instead, it is argued that MOE should work more closely

with schools and other stakeholders to develop forward-looking learning eco-systems in schools where teaching is professionalized, assessments are responsibly leveraged, different forms of student talents are adequately nurtured, and external stakeholders can contribute toward the education agenda and are co-opted into the education process. When MOE and school leaders are able to effectively harness teachers' collective energies to learn in professional learning communities and design learning in concert with the broader environment, schools will become more responsive to burgeoning expectations in the KBE. They will also be able to exercise responsibility in constructing meaning in uncharted territory and trailblazing new learning paradigms, especially with regards to identifying and nurturing alternative types of non-academic talents in students. Foreseeably, these capabilities have the potential to enable MOE and schools to maintain cognitive and moral legitimacy in the eyes of their myriad stakeholders. With this affirmation, these institutions will be able to contribute, with enhanced levels of organizational legitimacy, to the preparation of students for the brave new world of work in the KBE.

References

- Aldrich, H. E. (2008) *Organizations and environments* (Reprinted ed.) (Stanford, Stanford Business Classics).
- Aldrich, H. E. & Fiol, C. M. (1994) Fools rush in? The institutional context of industry creation, *Academy of Management Review*, 19(4), 645-670.
- Aldrich, H. E. & Ruef, M. (2006) *Organizations Evolving* (2nd ed.) (Thousand Oaks, Sage).
- Allais, S. (2012) 'Economics imperialism', education policy and educational theory, *Journal of Education Policy*, 27(2), 253-274.
- Ananiadou, K. & Claro, M. (2009) *21st century skills and competencies for New Millennium Learners in OECD countries - OECD Education Working Papers No. 41*. Available online at: http://www.oecd-ilibrary.org/education/21st-century-skills-and-competences-for-new-millennium-learners-in-oecd-countries_218525261154 (accessed 31 August 2012).
- Apple, M. W. (2004) Creating difference: neo-liberalism, neo-conservatism and the politics of educational reform, *Educational Policy*, 18(1), 12-44.
- Appold, S. J. (2001) Is meritocracy outmoded in a knowledge-based economy? *Singapore Economic Review*, 46(1), 17-48.
- Ashforth, B. E. & Gibbs, B. W. (1990) The double-edge of organizational legitimation, *Organization Science*, 1(2), 177-194.
- Ashton, D. & Green, F. (1996) *Education, training and the global economy* (Cheltenham, Edward Elgar).
- Ball, S. J. (2008) *The education debate* (Bristol, The Policy Press).
- Barber, M. & Mourshed, M. (2007) *How the world's best-performing school systems come*

out on top. Available online at:

http://mckinseysociety.com/downloads/reports/Education/How-the-Worlds-Most-Improved-School-Systems-Keep-Getting-Better_Download-version_Final.pdf (accessed 29 December 2011).

Barber, M., Whelan, F. & Clark, M. (2010) *Capturing the leadership premium: how the world's top school systems are building leadership capacity for the future*. Available online at:
http://www.mckinsey.com/clientservice/Social_Sector/our_practices/Education/Knowledge_Highlights/~media/Reports/SSO/schoolleadership_final.ashx (accessed 29 December 2011).

Bhaskaran, M., Ho, S. C., Low, D., Tan, K. S., Vadaketh, S. & Yeoh, L. K. (2013).

Background paper: inequality and the need for a new social compact, in: S. H. Kang & C.-H. Leong (Eds) *Singapore perspectives 2012 – Singapore inclusive: bridging divides* (Singapore, World Scientific), 125-158.

Boulding, K. E. (1978) The legitimacy of the business institution, in: E. M. Epstein & D. Votaw (Eds) *Legitimacy, responsibility and rationality: search for new directions in business and society* (Santa Monica, Goodyear), 83-97.

Brown, P. & Hesketh, A. (2004) *The mismanagement of talent: employability and jobs in the knowledge economy* (Oxford, Oxford University Press).

Brown, P. & Lauder, H. (2001) The future of skill formation in Singapore, *Asia Pacific Business Review*, 7(3), 113-138.

Castells, M. (1992) Four Asian tigers with a dragon head: a comparative analysis of the state, economy, and society in the Asia Pacific Rim, in: R. Applebaum & J. Henderson (Eds) *States and development in the Asian Pacific Rim* (Newbury Park, Sage), 33-70.

Dimmock, C. (2011) *Diversifying schools and leveraging school improvement: a*

- comparative analysis of the analysis of the English radical and Singapore conservative, specialist schools' policies, *British Journal of Educational Studies*, 59(4), 439-458.
- Dimmock, C. & Goh, J. W. P. (2011) Transformative pedagogy, leadership and school organisation for the twenty-first-century knowledge-based economy: the case of Singapore, *School Leadership & Management*, 31(3), 215-234.
- Dimmock, C. & Tan, C. Y. (in press) Educational leadership in Singapore: tight coupling, sustainability, scalability, and succession, *Journal of Educational Administration*.
- Dowling, J. & Pfeffer, J. (1975) Organizational legitimacy: social values and organizational behaviour, *Pacific Sociological Review*, 18(1), 122-136.
- Dutta, S. (Ed). (2012) *The Global Innovation Index 2012: stronger innovation linkages for global growth* (Fontainebleau, INSEAD & World Intellectual Property Organization).
- Freeman, J., Carroll, G. R. & Hannan, M. T. (1983) The liability of newness: age dependence in organizational death rates, *American Sociological Review*, 48(5), 692-710.
- George, C. (2013) Information, insulation and the public interest, in: S. H. Kang & C.-H. Leong (Eds) *Singapore perspectives 2012 – Singapore inclusive: bridging divides* (Singapore, World Scientific), 109-115.
- Goh, C. T. (1997) *Speech by Prime Minister Goh Chok Tong at the opening of the 7th International Conference on Thinking on Monday, 2 June 1997, at 9.00 am at the Suntec City Convention Centre Ballroom.* Available online at: <http://www.moe.gov.sg/media/speeches/1997/020697.htm> (accessed 7 September 2011).
- Goh, K. S. & Education Study Team (1979) *Report on the Ministry of Education 1978* (Singapore, MOE).
- Gopinathan, S. (2005) *Remaking the Singapore curriculum: trends, issues and prospects.*

Paper presented at the *First Conference of Asia Pacific Curriculum Policy Makers*, Hong Kong, China.

- Gopinathan, S. (2007) Globalisation, the Singapore developmental state and education policy: a thesis revisited, *Globalisation, Societies and Education*, 5(1), 53-70.
- Gopinathan, S. & Deng, Z. (2006) Fostering school-based curriculum development in the context of new educational initiatives in Singapore, *Planning & Changing*, 37(1/2), 93-110.
- Gopinathan, S., Wong, B. & Tang, N. (2008) The evolution of school leadership policy and practice in Singapore: responses to changing socio-economic and political contexts ("Insurgents," "Implementers," "Innovators"), *Journal of Educational Administration and History*, 40(3), 235-249.
- Han, C. (2009) Creating good citizens, or a competitive workforce, or just plain political socialization, in: M. Lall & E. Vickers (Eds) *Education as a political tool in Asia* (London and New York, Routledge), 102-119.
- Han, F. K., Ibrahim, Z., Chua, M. H., Lim, L., Low, I., Lin, R and Chan, R. (2011) *Lee Kuan Yew: hard truths to keep Singapore going* (Singapore, Straits Times Press).
- Harris, R. G. (2001) The knowledge-based economy: intellectual origins and new economic perspectives, *International Journal of Management Reviews*, 3(1), 21-40.
- Heng, S. K. (2011) *Opening address by Mr Heng Swee Keat, Minister of Education, at the Ministry of Education Work Plan Seminar, 2011*. Available online at: <http://www.moe.gov.sg/media/speeches/2011/09/22/work-plan-seminar-2011.php> (accessed 1 October 1 2011).
- Heng, S. K. (2012) *Prepared remarks for Mr Heng Swee Keat, Minister for Education, on "Education for Competitiveness and Growth" at the Singapore Conference in Washington, D.C., USA, on Wednesday, 8 February 2012*. Available online at:

<http://www.moe.gov.sg/media/speeches/2012/02/08/speech-by-mr-heng-swee-keat-at-the-singapore-conference-washington-dc-usa.php> (accessed 17 July 2012).

- Ho, K. L. (2003) Shared responsibilities, unshared power: the politics of policy-making in Singapore (Singapore, Eastern Universities Press).
- Ho, P. (2013) Model of governance: big government or big people? in: S. H. Kang & C.-H. Leong (Eds) Singapore perspectives 2012 – Singapore inclusive: bridging divides (Singapore, World Scientific), 117-124.
- Hogan, D. & Gopinathan, S. (2009) Knowledge management , sustainable innovation and pre-service teacher education in Singapore, in: J. Furlong, M. Cochran-Smith & M. Brennan (Eds) Policy and politics in teacher education: international perspectives (London & New York, Routledge), 107-122.
- Hunt, C. S. & Aldrich, H. E. (1996) Why even Rodney Dangerfield has a home page: legitimizing the world wide web as a medium for commercial endeavors. Paper presented at the *Academy of Management Conference*, Cincinnati.
- Illich, I. (1971) Deschooling society (New York, Harper & Row).
- Khong, L. Y.-L. & Ng, P. T. (2005) School-Parent Partnerships in Singapore, Educational Research for Policy and Practice, 4(1), 1-11.
- Lee, H. L. (2006) *Speech by Prime Minister Lee Hsien Loong at the Teachers' Day Rally 2006*. Available online at: <http://www.moe.gov.sg/media/speeches/2006/sp20060831.htm> (accessed 1 October 1 2011).
- Levin, H. M. (1974) A conceptual framework for accountability in education, School Review, 82(3), 363-391.
- Maurer, J. G. (1971) Readings in organizational theory: open systems approaches (New York, Random House).
- McKenna, S. & Richardson, J. (2009) Education in a one-party "democracy", in: D. Hill (Ed)

The rich world and the impoverishment of education (New York & London, Routledge), 223-237.

Meyer, J. W. (1977) The effects of education as an institution, *American Journal of Sociology*, 83(1), 55-77.

Meyer, J. W. & Scott, W. R. (1983) *Organizational environments: ritual and rationality* (1st ed) (Beverly Hills, Sage).

Meyer, J. W. & Scott, W. R. (1992) Centralization and the legitimacy problems of local government, in: J. W. Meyer & W. R. Scott (Eds) *Organizational environments: ritual and rationality* updated edition (2nd ed) (Newbury Park, Sage), 199-215.

MOE. (2010a) *MOE to enhance learning of 21st century competencies and strengthen art, music and physical education*. Available online at: <http://www.moe.gov.sg/media/press/2010/03/moe-to-enhance-learning-of-21s.php> (accessed 1 October 1 2011).

MOE. (2010b) *Teacher work attachment*. Available online at: <http://www.academyofsingaporeteachers.moe.gov.sg/cos/o.x?c=/ast/pagetree&func=view&rid=1068678> (accessed 1 October 1 2011).

MOE. (2011a) *Desired outcomes of education*. Available online at: <http://www.moe.edu.sg/education/desired-outcomes/> (accessed 7 September 2011).

MOE. (2011b) *Education and career guidance*. Available online at: <http://www.moe.gov.sg/education/programmes/social-emotional-learning/education-career-guidance/> (accessed 1 October 2011).

Morris, M. & Western, B. (2005) Inequality in earnings at the close of the twentieth century, in: R. Swedberg (Ed) *New developments in economic sociology* (Vol. 2, reprinted from 1999) (Cheltenham & Northampton, Elgar), 448-482.

Mourshed, M., Chijioke, C. & Barber, M. (2010). *How the world's most improved school*

- systems keep getting better*. Available online at:
<http://ssomckinsey.darbyfilms.com/reports/EducationBookNov23.pdf> (accessed 6 June 2011).
- MTI. (2011) Key household income trends, 2010 (Singapore, Department of Statistics, MTI).
- Neo, B. S. & Chen, G. (2007) *Dynamic governance* (Singapore, World Scientific).
- Ng, E. H. (2011) New chapter in the Singapore Story, *The Straits Times*.
- New Commission on the Skills of the American Workforce (2006) *America in the global economy* (Washington, New Commission on the Skills of the American Workforce).
- Ng, I. Y. H. & Rothwell, D. (2009) A rising tide lifts no sunken boat, *Social Space*, 2, 92-98.
- Ng, P. T. (2008a) Educational Reform in Singapore: from Quantity to Quality, *Educational Research for Policy and Practice*, 7(1), 5-15.
- Ng, P. T. (2008b) Thinking Schools, Learning Nation, in: J. Tan & N. Pak Tee (Eds) *Thinking Schools, Learning Nation: contemporary issues and challenges* (Singapore, Prentice Hall), 1-6.
- Ng, P. T. (2010) The evolution and nature of school accountability in the Singapore education system, *Educational Assessment, Evaluation and Accountability*, 22(4), 275-292.
- OECD. (2001) *Competencies for the knowledge economy*. Available online at:
<http://www.oecd.org/dataoecd/42/25/1842070.pdf> (accessed 7 September 2011).
- Perrow, C. B. (1970) *Organizational analysis: a sociological view* (Belmont, Brooks/Cole).
- Powell, W. W. & Snellman, K. (2004) The knowledge economy, *Annual Review of Sociology*, 30(1), 199-220.
- Richardson, A. J. (1985) Symbolic and substantive legitimation in professional practice, *Canada Journal of Sociology*, 10(2), 139-152.

- Rooney, D., Hearn, G. & Ninan, A. (2005) Handbook on the knowledge economy (Cheltenham, Edward Elgar).
- Schwab, K. (Ed) (2011) The Global Competitiveness Report 2011-2012 (Geneva, World Economic Forum).
- Scott, W. R. (1977) Effectiveness of organizational effectiveness studies, in: P. S. Goodman & J. M. Pennings (Eds) New perspectives on organizational effectiveness (San Francisco, Jossey-Bass), 63-95.
- Scott, W. R. (1991) Unpacking institutional arguments, in: W. W. Powell & P. J. DiMaggio (Eds) The new institutionalism in organizational analysis (Chicago, University of Chicago Press), 164-182.
- Scott, W. R. (1994) Institutional analysis: variance and process theory approaches. Employee training: the expansion of organizational citizenship, in: W. R. Scott, J. W. Meyer & Associates (Eds) Institutional environments and organizations: structural complexity and individualism (Thousands Oaks, Sage), 81-99.
- Scott, W. R. & Meyer, J. W. (1991) The organization of societal sectors: prepositions and early evidence, in W. W. Powell & P. J. DiMaggio (Eds) The new institutionalism in organizational analysis (Chicago, The University of Chicago Press), 108-140.
- Sharpe, L. & Gopinathan, S. (2002) After effectiveness: new directions in the Singapore school system? *Journal of Education Policy*, 17(2), 151-166.
- Stinchcombe, A. L. (1965) Social structure and organizations, in: J. G. March (Ed) Handbook of organizations (Chicago, Rand-McNally), 142-193.
- Suchman, M. C. (1995) Managing legitimacy: strategic and institutional approaches, *Academy of Management Review*, 20(3), 571-610.
- Tan, C. (2011) Philosophical perspectives on educational reforms in Singapore, in: W. Choy

- & C. Tan (Eds) *Education reform in Singapore: critical perspectives* (Singapore, Prentice Hall), 13-27.
- Tan, C. Y. (2012) Instructional leadership: toward a contextualised knowledge creation model, *School Leadership & Management*, 32(2), 183-194.
- Tan, C. Y. & Dimmock, C. (in press) How a 'top-performing' Asian school system formulates and implements policy: the case of Singapore, *Educational Management Administration & Leadership*.
- Tan, J. (2007) Pulling together amid globalization: National Education in Singapore schools, in: P. D. Hershock, M. Mason & J. N. Hawkins (Eds) *Changing education: leadership, innovation and development in a globalizing Asia Pacific* (Hong Kong, Springer & Comparative Education Research Centre, The University of Hong Kong), 183-197.
- Tan, Y. K., Chow, H. K. & Goh, C. (2008) *Examinations in Singapore: change and continuity (1891-2007)* (Singapore, World Scientific).
- Teo, Y. (2011) *Neoliberal morality in Singapore: how family policies make state and society* (London & New York, Routledge).
- Tharman, S. (2004) *Speech by Mr Tharman Shanmugaratnam, Minister for Education, at the MOE Work Plan Seminar 2004, on Wednesday, 29 September 2004 at 9.50 am at the Ngee Ann Polytechnic Convention Centre*. Available online at: <http://www.moe.gov.sg/media/speeches/2004/sp20040929.htm> (accessed 7 September 2011).
- The World Bank (2012) *KEI and KI indexes*. Available online at: http://info.worldbank.org/etools/kam2/KAM_page5.asp (accessed 17 July 2012).
- Thurow, L. C. (2000) *Building wealth: the new rules for individuals, companies, and nations in a knowledge-based economy* (New York, Harper Business).
- Tuomi-Grohn, T. & Engestrom, Y. (2003) *Conceptualizing transfer: from standard notions to*

developmental perspectives, in: T. Tuomi-Grohn & Y. Engestrom (Eds) *Between school and work: new perspectives on transfer and boundary crossing* (Oxford, Pergamon), 19-38.

United States National Research Council (1999) *The changing nature of work* (Washington, NRC).

Wong, T. (2011) MOE reviewing high-stake exams, *The Straits Times*.

Zimmerman, M. A. & Zeitz, G. J. (2002) Beyond survival: achieving new venture growth by building legitimacy, *Academy of Management Review*, 27(3), 414-431.