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Educating the developmental state: policy integration and mechanism redesign in Singapore's SkillsFuture scheme

J. J. Woo

School of Social Sciences, Nanyang Technological University, Singapore; John F. Kennedy School of Government, Harvard University, Cambridge, MA, USA

ABSTRACT

As an archetypal developmental state, Singapore has always emphasized the role of higher education as a means of human capital development. The recent introduction of the SkillsFuture scheme represents a similarly development-oriented higher education policy initiative. Taking a policy design approach and drawing from mechanism design, this paper argues that the SkillsFuture scheme constitutes an act of policy 'integration', whereby new policy instruments and goals are added to an existing policy mix without compromising instrument mix consistency or coherence of policy goals. However, the presence of information asymmetries has also resulted in a need for 'mechanism redesign'.

Introduction

As an advanced economy that is currently undergoing extensive economic transformation, Singapore has been placing a strong emphasis on higher education as a means of ensuring the availability of the skills and talent required for its increasingly service-oriented and digitized economy. A recently released report by the government's Committee on the Future Economy emphasizes the role of universities and other tertiary institutes in ensuring that workers possess the necessary skills and capabilities for new and emerging economic sectors (Committee on the Future Economy, 2017).

Aside from this emphasis on higher education institutions, the Singapore government has also introduced a SkillsFuture scheme that provides citizens with opportunities for skills training and lifelong education. Introduced in late 2015, SkillsFuture is a relatively recent addition to Singapore's higher education policy mix that has nonetheless achieved a certain level of success, in terms of public participation and take-up rate, among both citizens and enterprises (Hui, 2017).

This paper takes a policy design approach to understanding Singapore's higher education system and the role of higher education initiatives as policy instruments in the attainment of developmental policy goals, focusing specifically on the SkillsFuture scheme. It also draws from mechanism design to assess the impacts of information

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CONTACT J. J. Woo ✉ jjwoo@ntu.edu.sg; woojunjie112@gmail.com

asymmetries in the SkillsFuture scheme, as well as subsequent efforts to meliorate these asymmetries through mechanism redesign.

Based on these, I argue that the introduction of SkillsFuture represents an act of policy integration, whereby new policy instruments and goals are added to an existing policy mix without compromising instrument mix consistency or coherence of policy goals. However, policy integration is not a static process. Rather, policy designers often engage in mechanism redesign, in the process adapting an instrument or mechanism in response to post-implementation problems such as information asymmetry. More broadly speaking, the melding policy design and mechanism design in the study of policy implementation can provide a useful way of understanding the dynamic and (re) iterative processes that are often involved in the design and redesign of policies.

Rather than provide a historical account of Singapore's higher education system, which has already been a subject of extensive research (Gopinathan, 2007), this paper will take a more targeted and design-centric approach by assessing the SkillsFuture scheme as a recent addition to Singapore's higher education policy mix and seeking to understand its interactions and synergies with other policy instruments and goals in Singapore's higher education policy mix. In doing so, it aims to provide a starting point for future work on policy and mechanism design dynamics in higher education, especially at the intersection of education and economic development.

The following section will provide an overview of Singapore's higher education system, focusing in particular on its universities, and its role in the city-state's economic development. This is followed by a more general discussion of the policy design literature as well as the design elements of Singapore's higher education system. Having provided this necessary context of Singapore's higher education system and policy design, I will then provide a more targeted discussion of the SkillsFuture scheme, focusing on the ways in which it is integrated into Singapore's existing higher education policy mix as well as the instances of mechanism redesign that have emerged in response to information asymmetry. I will then conclude with suggestions for further research.

Higher education and development in Singapore

Singapore's education system has long been associated with the government's economic development strategies. Given its relatively small population and hence limited workforce, the education system has become a means through which Singapore's workforce could be educated and prepared in response to industry needs (Birger, Lee, & Goh, 2008; Gopinathan, 2007). This stems from Singapore's 'developmental state' approach to economic governance (Huff, 1995; Low, 2001a; Perry, Kong, & Yeoh, 1997), which typically relies on the 'implementation of policies in education and training designed to boost stocks of human capital', resulting in a 'tight coupling of education and training systems with state-determined economic policies' (Gopinathan, 2007, p. 57).

Indeed, the Ministry of Education's current vision of 'Thinking Schools, Learning Nation' focuses on developing 'a nation capable of thinking and committed citizens capable of meeting future challenges, and an education system geared to the needs of

the 21st century' (Ministry of Education Singapore, 2017a). This vision was first articulated during its inception in 1997 by then-Prime Minister Goh Chok Tong:

> A nation's wealth in the 21st century will depend on the capacity of its people to learn. Their imagination, their ability to seek out new technologies and ideas, and to apply them in everything we do will be the key source of economic growth. Their collective capacity to learn will determine the well-being of a nation. (Goh, 1997)

The MOE's vision and Prime Minister Goh's speech both serve to elucidate a crucial aspect of Singapore's education system: its central role in ensuring economic growth and development. As the MOE has emphasized, education forms the 'basis for survival & success' (Ministry of Education Singapore, 2017a). As it states on its website:

> People are our most precious resource. Every citizen is valuable and has a unique contribution to make. Through education every individual can realise his full potential, use his talents and abilities to benefit his community and nation, and lead a full and satisfying life. (Ministry of Education Singapore, 2017a)

Singapore's education system is therefore strongly focused on developing students that can contribute to national economic development. Indeed, even the strong performance of Singapore's 15-year olds in the 2015 Programme for International Student Assessment has been seen by the Ministry of Education as an indicator of these students' ability to 'thrive in the 21st century workplace' (Ministry of Education Singapore, 2016a).

It should, however, be noted that Singapore's education system does not focus solely on skills training but often includes as well the inculcation of specific social norms and values that can lead to overall social stability and cohesiveness. Green (1997, p. 147) notes that Singapore's education system has been crucial for Singapore's 'miraculous economic development', as well as the formation of a cohesive civic identity based on multiculturalism, multilingualism and meritocracy. Such social stability has been seen as a 'critical precondition for sustained economic growth' (Lim, 2015, p. 59). Education in Singapore is therefore seen as a policy instrument capable of ensuring both social cohesiveness and economic development.

As Gopinathan (2007, p. 68) has noted, Singapore's education policy was a 'key instrument in ... providing the subjectivities needed to bond the disparate ethnic groups and to provide the skills needed as industrial modernisation commenced'. This development orientation in Singapore's education policy flows into its higher education system. While Singapore's higher education institutions have always retained a focus on human capital development, it was only with the city-state's transition to a service and knowledge-based economy in the 1990s that the government sought to align higher education with industry needs, with polytechnics 'geared toward providing cutting-edge mid-level technical, management, and service skills, while the universities were tasked with training in high-level skills for both the public and private sectors' (Goh & Tan, 2008, p. 153).

Aside from imbuing its graduates with high-level skills, universities also support Singapore's ongoing transformation into a knowledge-based and innovation-driven economy by 'stimulating economic growth through industrially relevant research, technology commercialization, high-tech spin-offs, attraction of foreign talent, and injecting an entrepreneurial mindset among its graduates' (Wong, Ho, & Singh, 2007, p. 941).

Hence, universities, especially more established comprehensive universities such as the National University of Singapore (NUS) or Nanyang Technological University (NTU), were urged to expand their research and development activities as well as foster closer university-industry links (Goh & Tan, 2008, p. 153).

Singapore's higher education (or 'post-secondary') system currently comprises a range of educational institutions that cater to a broad array of students (Ministry of Education Singapore, 2016b). These include

- Public-funded ('autonomous') universities
  - NUS
  - NTU
  - Singapore Management University (SMU)
  - Singapore University of Technology and Design (SUTD)
  - Singapore Institute of Technology (SIT)
  - Singapore University of Social Sciences (SUSS) – formerly SIM University (UniSIM)
- Polytechnics
  - Nanyang Polytechnic
  - Ngee Ann Polytechnic
  - Republic Polytechnic
  - Singapore Polytechnic
  - Temasek Polytechnic
- Vocational training institutes
  - Institute of Technical Education
- Private educational institutions for the arts
  - Laselle College
  - Nanyang Academy of Fine Arts
- Other government-affiliated educational institutions
  - Building and Construction Authority Academy
  - Singapore Aviation Academy

Aside from these institutions, Singapore's higher education landscape also includes private educational institutions and foreign universities offering a range of post-secondary qualifications. The establishment of foreign universities in Singapore was related to the government's efforts to make Singapore a 'global schoolhouse' that can derive human capital benefits and industry knowledge from the teaching and research activities of these foreign universities and at the same time, make higher education itself a marketable asset by attracting fee-paying international students (Ng & Tan, 2010).

There is therefore a relatively broad array of educational institutions that serve Singapore's higher education landscape. However, and as I will argue below, these institutions, and the policies that have created and continue to sustain them, are essentially designed to achieve the government's policy goal of ensuring and enhancing economic development. Seen through the lens of policy design, Singapore's higher education institutions and policies allude to the presence of a set of policy 'tools' that can be applied to the attainment of economic development goals.

In order to understand this design-centric and development-oriented nature of Singapore's higher education system, there is first a need to establish a clear

understanding of what we mean by 'policy design'. The following section will therefore begin with a brief but concise overview of existing understandings of policy design. This will be followed by a broad conception of Singapore's higher education policy 'mix'. The SkillsFuture scheme will then be discussed within the context of this policy mix.

Singapore's higher education system as policy design

At its very fundamental conception, policy design distinguishes between policy means (instruments) and ends (goals), with the former seen as a way of attaining the latter (Lasswell, 1951, 1971). From this perspective, public policies are simply the tools, techniques or mechanisms that governments may have at their disposal to achieve a set of predetermined policy goals (Bressers & Klok, 1988; Howlett, 2011; Howlett & Rayner, 2007; Woodside, 1986).

The theoretical parsimony of this means-ends relationship, while continuing to animate much of the existing policy design literature, would also give rise to greater conceptual sophistication, as scholars of policy design sought to identify and categorize the various types of policy instruments and their varied functions and effects, often in response to the complexity and unpredictability that was discerned in the actual practice of designing policy instruments (Bemelmans-Videc, Rist, & Vedung, 1998; Elmore, 1987; Grabosky, 1995; Hood, 1986; Howlett, 2000; Woodside, 1986).

At the same time, economists began paying closer attention to policy design and implementation processes, giving rise to what is known as 'mechanism design'. Broadly defined, mechanism theory involves 'designing a "mechanism" by which a set of agents with productive capacities or consumption needs and preferences will interact with one another to produce resource allocation outcomes' (Mookherjee, 2008, p. 238). More specifically, a mechanism has been described as 'an institution, procedure or game for determining outcomes' (Maskin, 2008, p. 568).

Hence like policy design, mechanism theory is fundamentally interested in designing the *means* (in this case, mechanisms) through which a set of predetermined *goals* (allocation outcomes) can be achieved. In this context of mechanism design, Maskin (2008, p. 572) argues that policy implementation can be characterized by three questions:

(1) Under what conditions can a social choice rule be implemented?
(2) What form does an implementing mechanism take?
(3) Which social choice rules cannot be implemented?

However, and as Araral (2014, p. 291) has noted, there are limitations to the application of mechanism design to policy design; these include a tendency to assume that the design process begins tabula rasa on a blank policy canvass, a bias towards comprehensive policy change over incrementalism, as well as its lack of attention to the politics of policy design.

In contrast, the implementation of the SkillsFuture scheme has involved an incremental layering of a new policy instrument onto an existing policy mix. Nonetheless, inherent information asymmetries post-implementation have given rise to a need for mechanism redesign – incremental adaptations or adjustments to address information

asymmetry and, in this case at least, facilitate a transfer of information from policy users to policymakers. In order to address such incremental adaptations and inter-instrument dynamics, there is a need to draw on more recent policy design studies that take a more dynamic and comprehensive understanding of policy formulation and implementation.

Such work is based on a growing need to understand the micro-dynamics that often occur among policy instruments within a 'mix' or 'bundle' of instruments (Elmore, 1987; Gunningham, Grabosky, & Sinclair, 1998; Howlett, 2004; Rayner & Howlett, 2009; van der Doelen, 1998) as well as interactions that occur when new instruments are added to, or omitted from, an existing policy mix (Howlett & Rayner, 2013, 2014). This growing cognisance of inter-instrument dynamics and interactions also gave rise to studies on 'new governance arrangements' that seek to elucidate and conceptualize the design principles that underpin effective policy design amid such complexity and interactivity (Howlett & Rayner, 2007; Rayner & Howlett, 2009).

These latter efforts have allowed for a more systematic approach to understanding policy mix dynamics. Drawing on the work of Kathleen Thelen and Jacob Hacker on policy change (Hacker, 2004; Thelen, 2004), four major policy mix dynamics have been identified: policy layering, policy drift, policy conversion and policy integration, with each associated with a different permutation of ways in which policy instruments and/or goals tend to be added to, omitted from, or changed within a given policy mix. These policy mix dynamics are illustrated in Table 1.

While policy layering refers to the addition of new policy goals and policy instruments onto an existing regime without removing previous ones, policy conversion involves changes to policy instrument mixes without any change to policy goals (Béland 2007; Rayner & Howlett, 2009). Conversely, policy drift occurs when policy goals are changed but not the instruments used to attain them (Rayner & Howlett, 2009, p. 103). Finally, the ideal situation of policy integration occurs when policy instruments support, rather than undermine, each other (Howlett & Rayner, 2007, p. 7).

Furthermore and as Table 1 shows, different levels of instrument consistency and goal coherence are associated with the different policy mix dynamics. For instance, policy integration occurs when instrument mixes are consistent and policy goals are coherent. In contrast, a less systematic inclusion of new goals and instruments *a la* layering can result in inconsistent instrument mixes and incoherent goals. In the case of conversion, new instruments may be well integrated into the existing mix, but policy goals remain incoherently defined.

Lastly, drift occurs when new policy goals are not effectively mapped with or matched to existing policy instruments, resulting in an inconsistent instrument mix. In all instances, there is an underlying assumption that a well-integrated policy mix with a consistent mix of instruments and coherent goals is preferred, with all other situations (i.e. drift, conversion or layering) seen as suboptimal. The modelled provided in Table 1

Table 1. Policy mix dynamics.

Multiple goals	Instrument mixes	
	Consistent	Inconsistent
Coherent	Integration	Drift
Incoherent	Conversion	Layering

Adapted from Rayner and Howlett (2009).

therefore provides a useful metric for assessing policy mix optimality. It is with this conceptual frame that I now turn my attention to Singapore's higher education policy mix.

As discussed in the preceding section, Singapore's higher education system serves dual policy goals of supporting economic development (in terms of human capital development) and facilitating equitable social outcomes (ensuring equal access to post-secondary education), although, and as I have discussed above, this latter set of social policy goals are themselves means of fostering economic growth through social stability. Table 2 provides a list of the major policy instruments that have been implemented to achieve these two goals.

Policy instruments that are aimed at achieving social policy goals largely comprise efforts to ensure greater accessibility and affordability in university education. This includes expanding university enrolment through the creation of new degree-granting educational institutions such as SIT, SUTD, Yale-NUS Liberal Arts College and the Lee Kong Chian School of Medicine in NTU (Ministry of Education Singapore, 2016c). Indeed, the government has unveiled plans to increase Singapore's 'cohort participation rate', or the university enrolment rate of a given age group, to 40% by 2020 (Davie, 2016a; Ministry of Education Singapore, 2016d).

This is complemented by increased government expenditures on financial assistance for university students, in the form of tuition grants, loans, bursaries and scholarships (Ministry of Education Singapore, 2016e). This provision of financial assistance is predicated upon the role of education as a 'vital enabler of social mobility' that can contribute towards reducing income inequality (Ministry of Communications and Information Singapore, 2016; Ministry of Education Singapore, 2016e), although the impacts of education on social mobility have been mixed (Lee & Morris, 2016).

Beyond these social policy goals of social mobility and equitable distribution of university spaces however, Singapore's higher education system plays a crucial role in facilitating the attainment of economic development goals. For instance, Singapore's Global Schoolhouse strategy sought to establish a market for higher education by attracting fee-paying international students (Ng & Tan, 2010). While the Global Schoolhouse strategy was expected to increase the education sector's contribution to Singapore's GDP (Waring, 2014), the developmental role of Singapore's higher education is more strongly focused on human capital development.

An important aspect of such developmental goals involves aligning universities with industry needs. There have for instance been greater efforts at enhancing and deepening the role of universities as drivers of innovation and enterprise, with university research seen as a potential way to attract large enterprises, create new start-ups, as

Table 2. Singapore's higher education policy mix.

	Developmental goals	Social policy goals
Policy Instruments	Global Schoolhouse strategy Encouraging university-industry linkages Government Expenditure on R&D: RIE2020 Creation of industry-oriented universities (SIT and SUSS) Investments in research and innovation SkillsFuture	Expansion of university spaces Provision of grants, loans, bursaries and scholarships

well as enhance the technological and innovation capabilities of enterprises (Committee on the Future Economy, 2017, p. 69). This is predicated upon Singapore's desire to create a knowledge-based economy and encourage knowledge creation (National Research Foundation Singapore, 2017), with universities acting as 'brain trusts' and drivers of innovation and enterprise within the knowledge economy by facilitating the commercialization of knowledge, generating employment and 'creating tangible economic value' (Committee on the Future Economy, 2017, p. 70).

There is therefore an increasingly strong emphasis on how the research activities of Singapore's universities can contribute directly towards economic development. A concrete instance of how universities can contribute to industrial and economic development can be found in the Committee on the Future Economy's recommendations to create 'dense clusters of mutually-reinforcing economic activities' around universities, in order to 'strengthen the linkages between skills development, research and economic activity' (Committee on the Future Economy, 2017, p. 11).

One such cluster is the recently unveiled 'enterprise district' in the northeast district of Punggol, which aims to leverage on the SIT campus to foster the development of digital and cyber-security start-ups (Ng, 2017). Linkages between research and industry can also be found in the logistics industry, with research institutions and universities seen as useful resources for developing logistical and supply chain management capabilities (Committee on the Future Economy, 2017, p. 54). At the institutional level, various research centres and laboratories have been jointly established between universities and industry partners to foster entrepreneurial activity, along with launchpads that aim to encourage technology commercialization and start-up development (Lim, 2014, p. 3).

The establishment of these research centres, laboratories and research-industry clusters has necessitated increased government expenditures on research and development. In 2016, a SG $19 billion plan, under the auspices of the government's Research Innovation Enterprise 2020 Plan, was unveiled to support R&D activities in Singapore, in a bid to develop a 'knowledge-based innovation driven economy and society' (National Research Foundation Singapore, 2016). This is an 18% increase from its predecessor, the RIE2015 plan (Loke & Kek, 2016).

Aside from research, universities, along with other higher education institutions such as polytechnics and the institute of technical education, also play a key role in human capital development, especially in terms of providing the necessary skills and capabilities needed in Singapore's labour force. In particular, two universities – SIT and UniSIM – were designated as industry-focused institutions that provide 'applied' learning programmes, with SIT focused on science, technology and engineering and UniSIM specializing in the social sciences (Davie, 2016b; Ministry of Education Singapore, 2016b). UniSIM was subsequently restructured to become SUSS, Singapore's sixth autonomous university (Koh, 2017).

Universities have also sought to introduce a stronger focus on innovation in their curriculum, with examples including NTU's Renaissance Engineering Programme, SMU's Master of Innovation and NUS Faculty of Engineering's Innovation and Design-Centric Programme (Lim, 2014, p. 2). In almost all instances, the introduction of innovation and design into university curriculum was geared towards imbuing students with the necessary entrepreneurial skills and capabilities that can make them future 'leaders of

industry' or 'innovation leaders' (Nanyang Technological University, 2012; National University of Singapore, 2016; Singapore Management University, 2017).

Aside from universities, the Singapore government has recently introduced a SkillsFuture scheme that provides workers and adult learners with opportunities for skills training and reskilling. More importantly, SkillsFuture is not simply a stand-alone educational initiative; it complements the various other development-oriented instruments in Singapore's higher education policy mix that were discussed above. The SkillsFuture scheme is discussed next.

SkillsFuture as policy integration and mechanism redesign

Introduced in late 2015 and implemented in early 2016, the SkillsFuture scheme has been described by the Ministry of Manpower as a 'national movement to provide Singaporeans with the opportunities to develop their fullest potential throughout life, regardless of their starting points' (Ministry of Manpower, 2016). While similar schemes exist in EU member states (Cedefop, 2014; Government of France, 2017), these tend to focus mainly on labour policy outcomes. In contrast, the SkillsFuture scheme involves a broader array of policy instruments that target a wider range of beneficiaries over a longer term horizon (Teng, 2016).

Furthermore, the SkillsFuture scheme is administered and enforced by a newly established statutory board, SkillsFuture Singapore, which operates under the aegis of the Ministry of Education (SkillsFuture Singapore, 2017a). This places the SkillsFuture scheme squarely within the domain of higher education policy. It is important to note that while statutory boards, such as SkillsFuture Singapore, are technically semi-autonomous institutions, they operate under the supervision of an assigned ministry (Woo, 2014) and within Singapore's broader policy subsystem (Woo, 2015, 2016; Woo & Howlett, 2015).

At its inception, the scheme provided all Singaporeans aged 25 and above with SG $500 worth of 'SkillsFuture' credits that can be used to pay for a variety of courses (Chew, 2016). With the government expected to provide periodic top-ups to citizens' SkillsFuture credit account and eligible courses ranging from financial literacy to photography and cooking, the SkillsFuture scheme aims to encourage reskilling or the picking up of new skills among citizens, with the ultimate aim of ensuring a closer fit between workers' skills and competencies and the needs of the economy or industries (Chew, 2016; Ministry of Manpower, 2016).

Aside from these credits, SkillsFuture also includes a broader array of initiatives aimed at citizens that are different stages of their education and careers. These initiatives tend to involve different forms of state intervention and are aimed at achieving goals of economic development and/or societal development. These are illustrated in Table 3. As Table 3 shows, many of these SkillsFuture initiatives tend to involve government subsidies and incentives, although there are several initiatives that involve neither but instead aim to provide information to firms and citizens.

For instance, incentive-type initiatives such as the SkillsFuture credit scheme, study awards, enhanced internship, modular courses, fellowships, leadership development initiative, mentorship and young talent development programme involve direct disbursement of government funds and resources towards skills training. In some cases (e.g.

Table 3. Components of SkillsFuture scheme.

Initiatives	Type of intervention	Policy goal
Students		
Education and career guidance	Provision of information	Economic development
Enhanced internship	Incentive	Economic development
Young talent programme	Incentive	Economic development
Individual learning portfolio (now known as MySkillsFuture)	Provision of information	Economic development and social development
Fresh graduates		
SkillsFuture earn and learn programme	Subsidy	Economic development
SkillsFuture credit	Incentive	Economic development and social development
Working adults		
SkillsFuture modular courses	Incentive	Economic development and social development
SkillsFuture study awards	Incentive	Economic development and social development
Increased course subsidies	Subsidy	Economic development and social development
SkillsFuture fellowships	Incentive	Economic development
Sectoral manpower plans	Provision of information	Economic development
SkillsFuture leadership development initiative	Incentive	Economic development
SkillsFuture mentors	Incentive	Economic development and social development
SkillsFuture credit	Incentive	Economic development and social development

internships and fellowships), these initiatives focus solely on achieving economic development goals such as human capital development while in others (e.g. SkillsFuture credit scheme and study awards), both economic and social development are addressed, with a broader emphasis on individual and community development.

However, not all initiatives involve direct disbursement of resources. For instance, the SkillsFuture earn and learn programme and increased course subsidies operate as subsidies that aim to encourage individuals to take up skills training programmes, although the former is geared towards developmental goals such as ensuring a closer match between workers and organizations while the latter targets both economic and social development by enhancing citizens' overall learning opportunities. Initiatives such as education and career guidance or sectoral manpower plans operate as 'nodal' policy instruments (Hood, 1986) that provide information to individuals and organizations. In this case, both initiatives serve to attain economic development goals by providing citizens and organizations with information on trajectories for skills and industry development.

The SkillsFuture scheme's dual focus on developmental and social policy goals can be delineated into four key thrusts (Government of Singapore, 2016):

- Help individuals make well-informed choices in education, training and careers.
- Develop an integrated high-quality system of education and training that responds to constantly evolving needs.
- Promote employer recognition and career development based on skills and mastery.
- Foster a culture that supports and celebrates lifelong learning.

In terms of economic development, the first three thrusts described above – facilitating individuals' education, training and career choices, ensuring the education and training system responds to economic or industry needs, and ensuring employer recognition and career development – are focused on encouraging economic growth through skills development and labour force enhancement. Like Singapore's overall higher education system, there is a social policy component to the SkillsFuture scheme as well. As the Ministry of Manpower has stated, skills obtained by individuals through the SkillsFuture scheme will 'drive Singapore's next phase of development towards an advanced economy and inclusive society' (Ministry of Manpower, 2016). By imbuing citizens with new skills, the scheme aims to reduce income inequalities and enhance social inclusivity.

As a policy instrument, SkillsFuture therefore aims to achieve two goals: (1) driving the next phase of Singapore's economic development through skills development and (2) developing the fullest potential of Singaporeans. While the first goal focuses on economic policy objectives of human capital development and stimulating economic growth, the second goal alludes to social policy objectives of ensuring equitable provision of educational opportunities to working adults and fostering lifelong learning. It should, however, be noted that there are often overlaps between these two goals.

For instance, Singapore's Ministry of Education states that developing citizens' fullest potential involves equipping citizens not only with skills and knowledge but the 'right values and attitudes to assure the livelihood of the individual and the country's survival and success' as well, with these values and attitudes including self-reliance, teamwork, individual competitiveness, and a strong social conscience (Ministry of Education Singapore, 2017a). Reminiscent of the social norms and values that were discussed above, these 'right values and attitudes' are also expected to foster the socio-political stability that is often deemed necessary for economic development (Low, 2001b, 2006; Tan, 2012; Woo, 2016).

As the discussion has thus far shown, there is a significant extent of synergy between the SkillsFuture Scheme's policy instruments and goals with those of Singapore's existing higher education system. In both the SkillsFuture Scheme and Singapore's existing higher education policy mix, policy instruments tend to be state centric and development oriented, often involving direct state provision of resources and services, while policy goals are centred on economic development and social policy, with social policy goals further serving developmental purposes by ensuring social stability.

Indeed, this synergy between the SkillsFuture scheme and Singapore's higher education policy mix makes the introduction of the SkillsFuture scheme as a new policy instrument in Singapore's education policy mix, in the parlance of Table 1, an instance of policy integration, with a relatively high level of consistency maintained in instrument mix, and policy goals relatively coherent.

Such synergy or integration is reinforced by ongoing efforts at integrating the SkillsFuture scheme with other components of Singapore's higher education system. This is especially the case with growing efforts to integrate the SkillsFuture scheme with the rest of Singapore's higher education system, especially its universities. For instance, SkillsFuture Work-Study Degree Programmes were introduced in SIT and SUSS, with these programmes co-created and co-delivered with 12 partner companies and areas of study including potential growth sectors such as information security, software

engineering, hospitality business, electrical power engineering, civil engineering, finance and business analytics (Ministry of Education Singapore, 2017b).

Similar efforts at integrating the SkillsFuture scheme exist in Singapore's other major universities, with more courses made eligible for the use of SkillsFuture credits (National University of Singapore, 2017; Singapore Management University, 2015) or in the case of NTU, a College of Professional and Continuing Education established to develop adult education courses that can be funded or subsidized with SkillsFuture credits and the National Trade Union Congress's 'Union Training Assistance Programme' (Davie, 2016c; Nanyang Technological University, 2016). More recently, NUS has recently introduced a 3-year pilot allowing its alumni to take up to two courses free of charge, as part of the university's efforts to align itself with the SkillsFuture movement (Leow, 2017).

The SkillsFuture Scheme can also be seen as a mechanism that has been designed to achieve economic development and social policy goals. Like most mechanism designs, the SkillsFuture scheme involves an unequal or asymmetric distribution of information across its various stakeholders. This is most evident in a recent abuse of the SkillsFuture Credit Scheme, with four individuals charged for making false claims (Channel NewsAsia, 2017). In response, SkillsFuture Singapore has made moves to revise its claims processes, with future SkillsFuture Credit payments to be made to training providers rather than individuals (Straits Times, 2017).

The implementation of the SkillsFuture scheme therefore does not constitute what in Game Theory parlance is known as a 'one-shot game'. Rather, there is constant updating of information in response to information asymmetries and systemic abuses, and as a consequence, policy adaptations that aim to ensure a closer fit or integration between the SkillsFuture Scheme and Singapore's higher education policy mix. While mechanism design typically assumes a comprehensive design process that establishes new mechanisms on a 'blank canvas' (Araral, 2014), the design (and redesign) of the SkillsFuture scheme has proven to be more adaptive and incremental in nature.

Other perceived limitations in the SkillsFuture scheme may also give rise to future instances of mechanism redesign. Such limitations include an insufficient focus on soft and cross-job skills (Cheng, 2016), a lack of flexibility in the eligibility of courses, as well as an insufficient amount of SG $500 in SkillsFuture credits (Singapore Business Review, 2016). Aside from these limitations, there are also inherent inequalities in the SkillsFuture scheme, with Singaporean citizens eligible for SkillsFuture credits, but not permanent residents.

While SkillsFuture Singapore does not offer any explanations for excluding permanent residents and foreigners, aside from reasserting their commitment to Singaporean citizens (SkillsFuture Singapore, 2017b), there may be a deeper socio-political basis for this exclusion, especially in light of growing public discontent over the large scale immigration that had taken place over the past two decades (Cheng, 2017; Chong, 2012; Cunha, 2012). However, these limitations and issues are ongoing developments, with their impacts on higher education policy not immediately discernible.

Furthermore, these limitations intersect with perceived weaknesses in the policy design and mechanism design approaches. These include insufficient attention to the politics of the design process (Araral, 2014; Howlett, Mukherjee, & Woo, 2015; Schneider & Ingram, 1994; Schneider & Sidney, 2009) as well as a need to account for incremental adaptations to designs over time (Béland 2007; Araral, 2014; Howlett & Rayner, 2013;

Rayner, Forthcoming). The theoretical development required in order for policy design and mechanism design to adequately address these issues would certainly be far beyond the scope of this paper.

Nonetheless, the discussions provided in this paper have provided a useful first step for future research on policy and mechanism design, in higher education policy as well as other policy domains. These areas of potential future research are discussed next.

Conclusion

As this paper has shown, both policy design and mechanism design processes have been significant in the formulation and implementation of the SkillsFuture scheme. In the first instance, efforts to integrate the SkillsFuture scheme with Singapore's higher education policy mix lends credence to a recent policy design literature on new governance arrangemetns and integrated policy design (Béland 2007; Howlett & Rayner, 2007, 2014; Rayner & Howlett, 2009). As mechanism design, the scheme consolidates and harnesses the capabilities and resources of various actors, such as higher education providers, unions, individuals etc., for the attainment of developmental and social policy goals.

Yet, the presence of information asymmetries (particularly those between policy designers and policy users) has given rise to a subsequent need for mechanism redesign in order to address these asymmetries. These processes of policy integration and mechanism redesign are illustrated in Figure 1. As Figure 1 shows, both policy integration and mechanism redesign are crucial for the implementation and maintenance of the SkillsFuture scheme.

However, there remains insufficient work on mechanism redesign, while research on policy integration processes remain at a relatively nascent stage. There is therefore much scope for future research on these dynamic aspects of mechanism and policy design. As this paper has alluded, policy and mechanism design can be a reiterative process, with policy designs and mechanisms requiring adaptations and redesign in light of potential
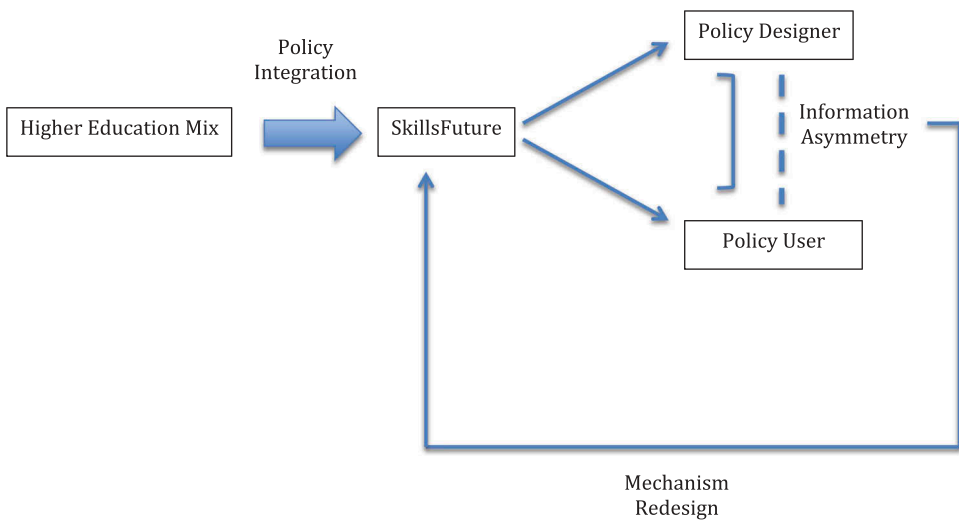

Figure 1. caption

post-implementation issues, such as information asymmetry. Such post-implementation issues tend to be exacerbated by growing policy complexity (Cairney, 2012; Capano & Woo, Forthcoming; Geyer & Rihani, 2010).

However, it would be beyond the scope of this paper to address these conceptual limitations. Far from being a definitive account of higher education policy and mechanism design dynamics, this paper has hopefully provided a useful first step towards further efforts at understanding policy design dynamics, especially in the field of higher education policy. Other potential avenues of future research could also involve understanding higher education policy and mechanism design dynamics in other contexts. Such empirical testing can contribute to the validity and accuracy of these analytical frameworks.

Furthermore, there are significant overlaps between policy design and mechanism design. As I have briefly mentioned, policy mixes and new governance arrangements can also be seen as mechanism or implementation designs that are formulated and put in place to achieve a desired policy outcome. Like mechanism designs, policy mixes often involve the reallocation of resources and information across the various actors and stakeholders involved in a particular policy domain. However, more research and conceptualization are required for a clearer explication of such linkages between policy design and mechanism design.

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No potential conflict of interest was reported by the author.

Notes on contributor

J.J. Woo is an Assistant Professor in the School of Social Sciences, Nanyang Technological University, and Rajawali Fellow at the John F. Kennedy School of Government, Harvard University. Dr Woo received his Ph.D. from the Lee Kuan Yew School of Public Policy, National University of Singapore. His research is focused on policy design and political economy in Asian global cities, with an emphasis on economic governance and the higher education system.

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