A NEW EDUCATIONAL PERSPECTIVE: THE CASE OF SINGAPORE

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Introduction: Education in Singapore Then and Now

Lying at the edge of peninsular Malaysia in the heart of Southeast Asia, Singapore is a post-colonial country with a population of 5.5 million individuals known for its tropical climate, technological advancement, and diverse population. The city-state ranks near the top of the world for various metrics on wellbeing, with a high GDP per capita, low unemployment, and high life expectancy in addition to a number of other metrics (Central Intelligence Agency, 2017). The nation's standing today as the financial capital of Asia and the most developed country of the region would have seemed an impossible goal at the nation's founding over 50 years ago. The Singaporean government has achieved ambitious goals through a variety of mechanisms, but education has proven to be the single most important investment the government has made in the course of its short history. Policymaking in this sphere has allowed Singapore to achieve some of the highest educational attainment rates in the world. It has become a model of urban education from which other countries and contexts may have valuable lessons to learn.

Singapore was founded in 1964 after a forced separation from Malaysia. With close to no natural resources, the government (under the leadership of Lee Kuan Yew) immediately made economic development its top priority, with targeted policies in foreign investment and education, primarily driving growth (Leggett, 2011). The education system at that time was quite different from its current state. The population was roughly a quarter of its current size at 1,646,400, and although the median age was 18, only 3,502 individuals were enrolled in a domestic university program, with another 4,659 enrolled in a teacher program or technical education program (Ministry of Education Singapore, 2015). While the United States was going through the "golden age of higher education" in this time period, a college education was simply not a viable option for most students in Singapore. Primary and secondary school enrollments were similarly low.

Educational institutions themselves at all levels also looked quite different. Secondary schooling, where today is made up of a diverse set of technical education, collegiate preparatory schooling, and arts and trades education, was far more limited. Secondary education was made up of British-run secondary schools taught in English, and Chinese schools taught in vernacular. Vast disparities existed between these two school systems, and those attending Chinese schools were generally unable to receive high-paying work in the labor market after graduation. Anyone who could afford foreign education would send their children to the United Kingdom or elsewhere abroad for schooling (Goh & Gopinathan, 2006). This structure was not unique at the time, and is in fact not dissimilar to the rest of the region today. A lack of significant progress in educational attainment rates has been a perpetual challenge for Southeast Asian countries, for a variety of reasons (Altbach, 2017). In 1964, the only universities in Singapore was a branch campus of the University of Malaya (a Malaysian institution) and Nanyang University, an institution which was formed to impart education in the Chinese language (Ministry of Education Singapore, 2015).

Today, however, Singapore is the top or among the top performers in the world on a number of educational metrics. The country boasts the number one ranking in the Programme for International Student Assessment (PISA), the highly visible and regarded international assessment conducted by the Organization for Economic Cooperation and Development (OECD) measuring the skills and knowledge of 15-year old students (OECD, 2015). Singapore also topped the 2015 Trends in International Mathematics and Science Study (TIMSS) in every single category, including math and science at both the primary and secondary school levels (NCES, 2015). In the November 2016 sitting of the International Baccalaureate (IB) Exam, 94 students received perfect scores worldwide. Of these, an astounding 93 students were from the Asia-Pacific region, and 57 (61%) of them were from Singapore alone, even though Singaporean students comprised only 36% of test-takers in the region and only 13% worldwide ("More than 60%", 2017).

According to the Ministry of Education's Educational Digest of 2015, the first-year intake of students in universities in Singapore in 2005 was 12,508. Four years later, the number of graduates was 11,947—a graduation rate of nearly 96% (Ministry of Education Singapore, 2015). Among other higher education sectors, including the polytechnic schools, art institutes, and technical education, graduation rates were similarly high, above 90%, though unlike universities, these courses of study are not all four years in length. More recently, in 2011, the first-year university intake was 15,566, and the number of graduates from this

batch was 15,236. For the same period of time, rates in other tertiary sectors were similarly high (Ministry of Education Singapore, 2016). These data show not only the burgeoning class sizes, which increased by 50% in the last ten years, but also the expansion of access without compromising graduation rates.

This remarkable high performance in such a highly urban, densely populated city contrasts with trends elsewhere in the world, particularly in the United States, where education outcomes in urban areas historically lags behind those of suburban areas. For example, in Los Angeles, the city in the Unites States closest in size to Singapore with a population of 3.9 million people, the high school graduation rate in 2010 was 62% (Kohli & Blume, 2016; U.S. Census Bureau, 2015). Of the population over 25, the percentage of high school degree holders was 74.5 percent (Statistical Atlas, 2010). However, in the 2010 Singapore census, 93.9% of those aged 25-34 had completed secondary school or above. Nearly half of that same population had a university degree. Among those aged 55 or older, the same metric is a scant 34.4% (Singapore Department of Statistics, 2010). With each generation over the last fifty years, educational attainment rates at all levels have gone up dramatically, reflecting the ever-growing investment the government has put into educating its citizenry. Urban areas' education attainment rates in the United States skyrocketed during the 20th century, but have stalled significantly in recent decades.

Policy levers in the Educational System

Singapore implemented a number of policy innovations both at the time of its founding and more recently. Collectively these changes gradually led to the transformation of Singapore's once fledgling educational infrastructure to one of the most successful in the world. Initially, these innovations took place predominantly at the primary school level, while more recently the focus has shifted to higher education as the education sector matured.

Singapore recognized that the rest of the education sector was built upon a strong primary school system, which at the founding of the country, suffered from low enrollment. Several priorities were established in developing this system. The first was an acknowledgment that vast racial disparities existed in educational opportunities, specifically among Chinese, Malay, and Indian students. The government accepted that a level playing field for all was crucial in setting up the education system, and thus began the process of significantly expanding primary schools through investments in the physical infrastructure of schools. Universal primary education was achieved by 1965 after the construction of 83 schools between 1959 and 1965, at a rate of one school per month. Primary school enrollment in the same period increased 33% from 272,254 to 362,672. In order further equalize educational opportunity, the Ministry of Education offered textbooks to needy pupils for free (Goh & Gopinathan, 2006).

At the same time, officials realized that the quality of instruction played a key role for later years of education. Massive investments were made in teacher recruitment, and although enrollment of primary school expanded at a rapid clip, the number of trained teachers kept pace, improving the teacher-to-student ratio from 31:1 to 29:1 (Ministry of Education Singapore, 2015). Teachers were recruited to programs at the National Institute of Education, the official training grounds for teachers in Singapore, and given slots through both full-time and part-time programs in order to maximize the number enrolled.

The official language of instruction became English, and bilingual education became mandatory, where students would learn either Mandarin, Malay, or Tamil in order to preserve their cultural heritage. As the fourth official language of the country, English was seen as a culturally unifying medium. Again, in this respect, a priority was related to equalizing opportunity between class and race. Similar burgeoning class sizes and curricular improvements occurred in the secondary school sector as the cohorts progressed. As the education sector expanded, new "tracks" were introduced at the secondary level, including polytechnic education, technical education, arts degrees, and of course, pre-university education which today primarily consists of the junior college system in Singapore. Singapore is also known worldwide for the high salary teachers receive, and for the extensive continuing training and learning opportunities they are offered every year.

Over time, Singapore has transitioned from making the most policy innovations in the pre-university sector to innovating highly in higher education. Paying for tertiary education in Singapore is relatively affordable, especially when considering the quality of education the institutions provide. All Singaporean citizens are automatically given a significant discount on their tuition from a mechanism called the Tuition Grant Scheme, which was introduced in 1980 after the official formation of the National University of Singapore ("First batch at NUS," 1980). The best analogue to this in the United States would be an "in-state" tuition rate at a public university. The exact value of the tuition grant varies depending on institution and on program within that institution, but is typically in excess of $20,000 Singaporean dollars (SGD), equivalent to approximately $14,200 USD. This significantly reduces the cost of attendance at most of the local university programs. For instance, a Singaporean citizen attending Nanyang Technological University for an undergraduate degree in Communication would have an out-of-pocket expense of $8,050 SGD ($5,726 USD) per year in tuition, down from $28,050 SGD ($19,954 USD) with the tuition scheme.

Students who are particularly low-income, or a member of an ethnic minority, are also eligible for additional funds from the Ministry of Education. These are called the Ministry of Education Bursary, the Community Development Council / Citizens

Consultative Committee grant, and the Mendaki scholarship. These vary in amount and are based on income level: students from lower income families receive more generous grants than their peers from more affluent families. For example, the Mendaki scholarship targets certain Singaporean minority populations and starts at 25% of tuition, though it can be as generous as covering full tuition and fees. If these awards (which except for the Mendaki are automatically disbursed to the student based on income level) do not cover the cost of attendance for a needy student, they may also qualify for a bursary from their attending institution, again based on household income. Of course, not all students qualify for such need-based aid. For those families who are not covered, it has become standard to take out loans to cover the rest of the cost of attendance and to pay it off afterwards. While debt-after-graduation figures are not publicly available in Singapore, the majority of students live at home for the duration of their four years of college attendance, limiting costs outside of tuition and fees. Taking on levels of debt is not traditionally seen as a barrier to higher education in Singapore. There are also a number of merit-based scholarship programs offered by various foundations which provide full university funding, typically coming with the stipulation that a graduate "pay it back" by working for the sponsoring organization for a number of years roughly equal to the number of years of support.

Since 2002, the Singaporean government has implemented the "Global Schoolhouse Strategy," which prioritized making Singapore the destination of choice for 150,000 international students a year by 2015 and more than doubled the education sector's share of contribution to the national GDP (Waring, 2014). In the same period, the Ministry of Education established several brand-new autonomous universities and expanded those already in existence. These include the Singapore University of Technology and Design, Singapore University of the Social Sciences, Yale-NUS College, and the significant expansion of the Singapore Management University, which was founded in 2000. Each institution serves a unique curricular sector, and was also established with the goal of making Singapore the premier destination for higher education (Waring, 2014). These options, in addition to tertiary education in different sectors including vocational training, artistic training, and technical education, mean that students have a variety of programs to choose from, all of which are heavily subsidized by the government to make them equally viable options.

Lessons for Educational Practitioners

There are a number of lessons that urban educators and policymakers can take from Singapore's education development over the last half-century.

One lesson is that coordinated efforts for primary and secondary schooling through higher education are necessary; innovation cannot be limited to one sector. Singapore's success early on derived from building an education system from the ground up. Burgeoning enrollments, increased capacity, and the maintenance of high quality instruction made education both accessible and attractive for families with children eligible for primary education. At the same time, funding cannot be shortchanged from one year to the next. Almost every year since the founding of the country, funding per-student over the last two decades has increased, increasing by over 100% at the primary and secondary levels, and 33% at the university level, from 2000 to 2015 (Ministry of Education Singapore, 2015). Sustained funding for education in a holistic manner is required in order to sustain the graduation rates (well above ninety percent) that Singapore enjoys. In the 1980s, the country even increased the spending on education from 4 to 5 percent of the GDP (Goh & Gopinathan, 2006).

Another lesson is that shifting mindsets and attitude on education in the culture is as important as policymaking itself. From the early days of Singapore's independence, education began to take on an importance to families that was unusual for the era. While the government was consciously investing tremendous resources in building up access to the education system, equally important to the burgeoning school enrollment was the emphasis that families placed upon education (Goh & Gopinathan, 2006). The cultural significance of education as a nation builder and bridge between cultures allowed the education sphere to serve as a connector between communities which previously suffered prohibitively strong inequalities of opportunity.

Lastly, improvements and changes in education must be made with a long-term mindset. In the 1960s the education system was quite drastically different in Singapore. The changes implemented in order to foster enrollment and completion did not always have immediate effects: a culture shift, for example, happens not instantaneously but gradually. Similarly, the effects of investments in teacher education and recruitment are not immediately visible, until their former pupils go on to achieve staggeringly high college graduation rates later in life. Often, policymakers and practitioners make changes hoping to have immediate impact or return on investment. The approach to such timescales in education must take a long-term perspective, approaching ten or more years at the least.

Conclusion

Singapore has gone from a developing nation, with low educational enrollment and completion, to becoming the premier education system in Asia. However, while Singapore has indeed become the standard of excellence in the developed world for urban education, it still faces challenges. Some criticize Singapore's education system for emphasizing rote-learning and high-

stakes exams over a pedagogy teaching creative thinking. Others point to a toxic school culture which causes high levels of emotional and mental stress for students. The achievement gap between individuals of different races and income levels, although much narrowed, still exists in Singapore.

While these and other problems continue to challenge the nation, much has changed for the better in the last 50 years and even in the last 15 years for education in Singapore. Rates of educational attainment at all levels continue to climb dramatically, while those graduating at the top are among the most academically competitive students in the world. These achievements starkly contrast with the relative lack of educational attainment in the aged population, clearly indicating that the government has made education a top priority through the last few generations. While no two nations or cities are the same or face the same challenges, other urban contexts could take lessons from the advancements in this school system, including coordinating innovation and funding at all levels of schooling, prioritizing a culture change, and taking the long view. As education continues to be an ever-more important part of becoming globally competitive, urban education practitioners and policymakers can look to Singapore for these and other lessons of working in a highly diverse, urban space.

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