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SEEKING UNIVERSAL EDUCATION: FROM SINGAPORE'S EDUCATIONAL SUCCESS

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**SEEKING UNIVERSAL EDUCATION:
FROM SINGAPORE'S EDUCATIONAL SUCCESS**

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Abstract

According to the Universal Declaration of Human Rights, education is considered as a fundamental human right. However, this right is not accessible for every child. Not all education systems are capable of providing quality education. There are various reasons behind this issue. Based on the OECD and PISA records, Singapore has a successful education system with multiple ethnicities and religions. This study intends to discover some characteristics of Singapore's education system and the feasibility of achieving similar success in other practices. In the methodology part, based on a literature review on education policy and education system of Singapore, content policy analyses were done in order to understand national priority. Next, to understand teachers' perception of the education system, remote interviews were done with primary teachers based across Singapore. The result suggests that national priority, close connection between educators, researchers and policymakers, teachers' education, human resources management, culture-linked system, and continuous iteration of education reforms are critical for strong education practices globally.

Key Words: Singapore education system, education policy, school leadership, teachers

Introduction

Today education is considered as a fundamental human right by the United Nations (UN). It becomes more important as low-skill jobs are being automated and demand of the labor market shifts to high-skill jobs. There are some countries that have done well in the last 20-30 years in giving high-quality education to their youth. On the other hand, unfortunately, a lot more countries have struggled to build high-quality education systems to prepare their nation for today and future needs. This is an issue which requires focused effort from countries and international organizations. Much can be achieved by collaboration between countries and organizations, learning from succeeding countries to lift up the ones falling behind.

As a former educator and person who studied in an underdeveloped post-Soviet country - Azerbaijan - I have seen how lack of good-quality education can impact people's lives. After the collapse of the Soviet Union in the 1990s, most governmental organizations also deteriorated, and education was one of them. It was only in the early 2000s when Azerbaijan opened enough schools and started to adopt the modern education system. Nowadays, with the opportunities created by oil production, Azerbaijan is in a much better economic situation compared to the 90s, and there are a lot of educated teachers and public schools. According to 2012 data, the primary school pupil-teacher ratio in Azerbaijan is 11.92.¹ This is well above the global average, higher than some of the developed countries. Nevertheless, the success metrics of the Azerbaijani education system fall behind many countries.² I worked for four years as English teacher in Azerbaijan between 2015-

¹“Education > Pupil-teacher ratio, primary: Countries Compared,” Nationmaster.com, accessed February 25, 2021, <https://www.nationmaster.com/country-info/stats/Education/Pupil--teacher-ratio,-primary> .

²OECD, 2018-2019 report

2019. During my time as a teacher, I taught students from public and private schools and observed a gap in the knowledge of public-school students.

Being aware of this made me curious about other education systems to understand what can be done better. I have researched some of the most successful education systems, such as the South Korea, Finland, and Singapore education systems. According to Program for International Student Assessment (PISA) results, these three countries stay in the top ten places and also in different years they came in first place. They are culturally, historically, and systematically different countries, but they achieve similar education successes by using different systems. After analyzing those three countries, I found out that both Finland and South Korea's education system is deeply connected to their culture. For example, Reading is a daily habit for Finland's people, so 70% of Finland's people read newspapers and books every day. This habit of their whole nation, including adults, plays a big role in Finland's youth educational success. In South Korea, people are affected by the Confucian theory that puts importance to studying in order to achieve meaning in life.³ Given the reason, it is complicated to replicate this in other countries because it is beyond the education system.

On the other hand, Singapore's education system has a great deal of aspects that are relevant to a lot of other countries that are struggling with establishing a high-quality education system. What I found interesting about Singapore is that it is a very new country that was founded in 1965. Singapore consists of multiple ethnicities such as Chinese, Indian, Malay, and others, including many expats. Although Confucian is the dominant culture, the country set multiculturalism and multi-ethnicity as its identity. It is vital to mention that during the 1950s-the 1970s, Singapore

³Shin, Sunwoo, and Myung Sook Koh. 2005. "Korean Education in Cultural Context." *Essays in Education* 14(January).p.35.<https://search.ebscohost.com/login.aspx?direct=true&AuthType=sso&db=edsoaf&AN=edsoaf.bb38773e30df285dec458ddc92beb89a50adcbff&site=eds-live&scope=site>.

was dissected ethnically and linguistically, which was known as a “failed state” and segmented education.⁴ There were multiple ethnicities which created ethnic tension after Singapore separated from Malaysia. They also only had a port-based economy which covers 70% of the national GDP. Education was also in danger because only 400 out of 1000 primary children went to secondary school and drop-out rates were tremendously high. They do not have any natural resources, and the government understood that in order to survive and improve the country, they need a strong education system with educated and professional people. Singapore is an exemplary country to prove one education system can help people of many ethnicities to succeed in learning.

Given all of these achievements, I believe some characteristics of Singapore's education system can be applied universally by many countries worldwide. There are some important questions to discuss. Why do we need a universal education system? And why Singapore? How could there be global standards that dictate quality education that then adopt within their cultural system? What is the issue with national priority?

I think the answer to the above questions are as follows: Learning is a vital activity of modern humans and spans out a significant portion of our life. Humans are equally capable of learning regardless of their ethnicity, culture. The success of learning is dependent on many aspects, including society, culture, school system, the welfare of the family. With the power of globalization and the internet, people who live in different parts of the world became more and more similar. There are more and more universal education contents, called Massive Open Online Courses (MOOC), mainly in Science, Technology, Engineering, and Mathematics (STEM), which

⁴Dimmock, Clive, and Cheng Yong Tan. 2016. “Explaining the Success of the World’s Leading Education Systems: The Case of Singapore.” *British Journal of Educational Studies* 64 (2): 161–84. doi:10.1080/00071005.2015.1116682.

learners worldwide use. MOOCs are used tremendously around the world and in 2020 180 Million learners⁵ were registered for them. This indicates that education is becoming more international.

As Nelson Mandela said, "Education is the most powerful weapon which you can use to change the world." If it is possible to cure an illness globally with one vaccine, I believe we can also develop the components of a global education system. Getting quality education to a satisfactory level universally is a hard problem, and it requires effort from everyone. In this research, I will provide some successful aspects of Singaporean education that can be applied globally. I chose Singapore as a universal education role model. To find key success factors and implement them in any other country, I will examine Singapore's primary education because it is the first step of a child's learning path. In this capstone project, the research question is: What elements of Singapore's education system can contribute to a model of universal education?

Literature Review

Singapore is an island city-state established in 1965 after being expelled from the federation of Malaysia. It is the second most densely populated country in the world with a population of 5.7 million. As a small country which is located between many large countries, it had to achieve a lot to avoid survival risks. Since the establishment of the country, Singapore adopted aggressive policies to improve the economic and political situation of the country. Investing in education has been a major part of it.

⁵"By The Numbers: MOOCs in 2020 — Class Central." Accessed April 9, 2021.
<https://www.classcentral.com/report/mooc-stats-2020/>.

Senior Prime Minister Goh Chok Tong mentioned that because Singapore does not have any resources except human capital. The country needs to adapt quickly to every environmental and economic change. So, investing in education was, is, and will help Singapore to improve its economy.⁶ The Education Minister Tharman Shanmugaratnam also said that they prepare people not only in today's workplace but also for future changes.⁷ While Singapore is known for its academic achievement in various examinations, the government also promotes innovation, diversity, and quality. In Singapore, school accountability, school excellence, and performance standards are highly related concepts with quality assurance.

Singapore's education system did not emerge suddenly; three reform phases are implemented according to the circumstances, which also cover their education policy. Singapore's education policy highly depends on reforms, observations, and research done by the Ministry of Education (MOE) and other related departments. They first started to teach the basics and aimed to produce a good person and valuable citizen for Singapore. They named the first phase "Survival-driven phase," which continued from 1959 to 1978. After gaining independence, Singapore dealt with a significant amount of unemployment, high population growth. The government saw the need to expand the industrial-based economy to interest foreign companies, but low-skilled workers hindered it. The government created schools, hired teachers, implemented the bilingual policy and created textbooks. This phase aimed to form a national public education system quickly to provide workers for industry and create Singapore as a nation with multiple ethnic groups.

⁶Goh, C. T. (2005). Investment in people pays off for the country (speech by Senior Minister Goh Chok Tong at the Jeddah Economic Forum, Saudi Arabia). *The Straits Times*, 22 February Issue

⁷Tharman, S. (2003). The next phase in education: Innovation and enterprise. Singapore Government Press Release. Speech by Mr Tharman Shanmugaratnam, Acting Minister for Education, at the Ministry of Education Work Plan Seminar, 2 October.

However, during this phase, the quality of education was deficient, except primary school, the next level showed dropouts because of national examinations.

The oil crisis 1970s increased competition in Asia. The Singapore government started working on their education policy to catch up with the high-skilled countries and stay united as a nation. Consequently, they moved to the next level, called the "Efficiency-driven phase," from 1979 to 1996. In this stage, education's focus shifted from a labor-intensive market to capital and skill-intensive market. The government introduced a new policy that did not support a "one-fits-all" approach as in phase 1, and it presented multiple pathways for students to reduce drop-out rates. Now students with different abilities chose appropriate streams based on their knowledge and exam results. It promotes meritocracy and also drop-out rates fall tremendously. According to MOE, in the second half of the 1980s, only less than 6% of students left the ten-year school compared to before it was a significant achievement. As a result, Singapore stood 1st place in math and science on the Trends in International Mathematics and Science Study (TIMSS) exam in 1995. One of this phase's primary goals is to entice more technology companies such as computer companies to Singapore and produce technical-knowledge students such as engineers and scientists. The second phase helped the Singapore education ministry and government to see their educational results precisely.

After the 1997 Asian Financial Crisis and well-defined results, the government saw a need to implement a new stage to reach global knowledge because of national growth and the competitive global situation. They started the "Ability-based phase" in 1997 till now (with some modification). On the road, the central tool for global knowledge is science and technology research departments since they provide funding in order to bring researchers and scientists. Singapore's universities, such as the National University of Singapore and Nanyang Technological

University, began to have a research partnership with international companies. The focus was mainly information sciences, medical technology. For school, the MOE introduced the "Thinking Schools, Learning Nation" (TSLN) initiative. The TSLN was based on "thinking schools," representing developing creative thinking skills, lifelong learning enthusiasm, "learning nation," meaning that every society's level learns and flourishes. This initiative paved the way for other educational initiatives. One of them would be expanding ICT utilization (Information and communication technology) in classrooms and every education stage. The curriculum and textbooks also improved and focused on the project, creativity, and communication skills. Schools gained accountability by creating their own goals and annual assessments. In 2004 under the umbrella of TSLN, the "Teach Less, Learn More" idea was introduced by the Prime Minister of Singapore. The concept proposes that giving less homework gives students more time to work on themselves and improve their skills. Although there is a widely recognized Singapore education system's success, MOE sees the extensive amount of curriculum content, students' study time, and other factors.

In 2004 the MOE formed the "Teach Less, Learn More" initiative and clarified that if teachers should teach less so students can learn more, the education system could change fundamentally from "quantity to quality". TSLN initiative consists of 2 parts: Thinking Schools and Learning Nations. Thinking Schools aims to promote lifelong learning, creative thinking, and civic responsibility in young Singaporeans. Learning Nation is the way to improve innovation, creativity in every tier of the nation.

Accepting TSLN policy, the government shifted the efficiency-driven paradigm with the ability-driven paradigm.⁸ This paradigm targets students with their abilities. There were many

⁸Ng, Pak Tee. 2008. "Educational Reform in Singapore: From Quantity to Quality." *Educational Research for Policy and Practice* 7 (1): 5–15. doi:10.1007/s10671-007-9042-x.

changes in syllabus, examinations, and university administration to promote creative thinking and take a risk. Two plans, namely National Education and Singapore Masterplan for IT in Education that launched in 1997, helped make schools more IT-based and encourage creative, independent learning. According to Minister Tharman Shanmugaratnam, the "Teach Less, Learn More" initiative dives deep into the core of education - why we teach, what we teach, and how we teach." He also emphasized that Singapore also achieved a higher place in TIMSS and other examinations, but it is quantity. The MOE and Singapore government understand that students may not engage in the learning process.⁹ TLLM encourages methodological progress in teaching and the learning process, so the education system transfers from quantity to quality. The initiative also requires students to engage in the learning process and take their own responsibility in their schooling. The initiative is to change the identity of teachers and students.

In order to achieve diversity in various endeavors, the MOE created diverse pathways for learners. There are different streamlines for every ability and learning path. The Singapore government and MOE work closely to boost the quality of education. There was some initiative formed to give schools more autonomy. In 1988 three high-ranked schools got autonomy to make their syllabus, teacher hiring, and other educational processes, and now total independent schools are 12.¹⁰

Tracking the quality of education is critical in education, and it affects all the education systems. The Singapore government implemented the School Excellence Model (SEM) in 2000, which captured a quality management system. In Singapore before SEM, all primary and

⁹Tharman, S. (2005b). Achieving quality: Bottom up initiative, top down support. Speech by Mr Tharman Shanmugaratnam, Minister for Education, at the MOE Work Plan Seminar 2005 at the Ngee Ann Polytechnic Convention Centre, Singapore, 22 September.

¹⁰Ng, P.T. 2021. "Quality Assurance in the Singapore Education System in an Era of Diversity and Innovation." *Educational Research for Policy and Practice* 6 (3): 235–47. Accessed March 18. doi:10.1007/s10671-007-9018-x.

secondary schools were ranked in the list and opened to the public. However, not all the parties in Singapore agreed with this ranking system. Minister Teo Chee Hean explained in Parliament that showing academic results according to school is a matter of accountability; otherwise, Singapore will also see the same results in the USA, United Kingdom, and other jurisdictions. The taxpayers and parents want to know what the school does, where their tax goes, and so on. The only tool Singapore needs to see accountability is ranking.¹¹

SEM's intention is to give identification accurately and measure the schools' strengths and areas for further development. The SEM analysis system includes the following criteria: leadership, strategic planning, staff management, resources, student-focused processes, administrative and operational results, staff results, partnership and society results, key performance results.¹² Overall, SEM is the self-assessment for school leaders to identify failed parts and improve them.

Singapore's government always intended to decentralize its power in order to give schools more autonomy to be innovative and diverse, moving away from the direct control model to the more remote supervisory model. However, the current situation is not decentralization in education, and it is a more likely form of centralized decentralization. According to policymakers, if the government lessens its influence in schools and the education system, there will be a risk of decreasing its power globally. The government mainly wants to maintain quality education while giving autonomy to schools. Minister Tharman mentioned that the purpose of exams in Singapore

¹¹Teo, C. H. (2002). Closing Speech by Rear Admiral Teo Chee Hean, Minister for Education, on the Junior College/Upper Secondary Recommendations at Parliament, Singapore, 27 November.

¹²Pak Tee, N. The Singapore School and the School Excellence Model. *Educational Research for Policy and Practice* 2, 27–39 (2003). <https://doi.org/10.1023/A:1024465302953>

is the core of education, serving as a meritocratic system. It presents clarity, showing parents and learners that entering school or universities is based on merit-confidence.¹³

Singapore's education system went into three-phase: standardization (the mid-1960s to mid-1980s), local accountability (mid-1980s to mid-1990s), diversity, and innovation (mid-1990s to today). According to a qualitative study with 26 vice-principals by Pak Tee Ng, there were two questions "what are Singapore schools accountable for?" "To whom are they accountable."¹⁴ The study took place in a big hall with vice-principals with anonymous papers.¹⁵ They should answer the questions and tick the appropriate answer in multiple-choice questions. The typical answer reveals that principals describe that they are accountable for learners' academic progress, staff supervision, and allocating the funding, public survival, and future of their country. It represents how teachers, or the MOE are responsible for education, but every person involved feels responsible for ensuring quality and accountability in education.¹⁶

Singapore's government always concentrates on taking consistent incremental steps in education. They continued this tradition in technological improvement and implementation of ICT in education and had three steps of e-learning advancement in school education. They named these stages as the National ICT plan for Education and divided them from basic to more equipped. The

¹³Tharman, S. (2004). To light a fire: Enabling teachers, nurturing students. Singapore Government Press Release. Speech by Mr Tharman Shanmugaratnam, Minister for Education, at the Ministry of Education Work Plan Seminar, 29 September.

¹⁴Ng, Pak Tee. 2013. "An Examination of School Accountability from the Perspective of Singapore School Leaders." *Educational Research for Policy and Practice* 12 (2): 121. doi:10.1007/s10671-012-9127-z.

¹⁵Ng, Pak Tee. 2013. "An Examination of School Accountability from the Perspective of Singapore School Leaders." *Educational Research for Policy and Practice* 12 (2): 121. doi:10.1007/s10671-012-9127-z.

¹⁶Tharman, S. (2004). To Light a Fire: Enabling Teachers, Nurturing Students. Ministry of Education. Press Release, 29 September.

First National ICT plan for Education (1997-2002)¹⁷ aimed to provide schools with a fundamental ICT foundation and train teachers to do a fundamental ICT integration level. In this stage, teachers were provided with 30 hours of ICT training with Senior ICT instructors. The Second National ICT plan for Education (2003-2008)¹⁸ concentrates on the practical and extensive ICT application in Education by spreading schools' innovations. In the second step, the government prioritized school-based teacher growth with workshops and, namely, other projects. The Third National ICT plan for Education (2009-2015)¹⁹ to modify students' learning contexts and provide them with significant competencies and characters required for a knowledge economy. In the last step, the government mainly focused on implementing and giving shape to the use of ICT for Singapore's future.

Singapore has given special importance to teachers' education. Although it has exemplary high-quality teachers in its public schools, this has not been the case for a long time in the early days of the country. In the 60s and 70s, Singapore faced a major shortage of teachers as the population boomed. To address this demand, they followed a student-teacher model where students would also teach part-time. The first institute to educate teachers was Teachers Training College. As Singapore closed the gap in the quantity of teachers, they turned the focus to the quality of them. The Institute of Education (IE) was established during 1970 to give bachelors and masters of education degrees. Additionally, a research center established within IE. Today

¹⁷Kong, S. C., C. K. Looi, T. W. Chan, and R. Huang. 2017. "Teacher Development in Singapore, Hong Kong, Taiwan, and Beijing for e-Learning in School Education." *JOURNAL OF COMPUTERS IN EDUCATION*. <https://search.ebscohost.com/login.aspx?direct=true&AuthType=sso&db=edsbl&AN=RN382639179&site=eds-live&scope=site>.

¹⁸Kong, S. C., C. K. Looi, T. W. Chan, and R. Huang. 2017. "Teacher Development in Singapore, Hong Kong, Taiwan, and Beijing for e-Learning in School Education." *JOURNAL OF COMPUTERS IN EDUCATION*. p-8, <https://search.ebscohost.com/login.aspx?direct=true&AuthType=sso&db=edsbl&AN=RN382639179&site=eds-live&scope=site>.

¹⁹Ibid. 10,

Singapore has one of the highest quality of educators. Their focus has been shifting to internationalize their education institutes to become a hub for other countries which want to increase their teacher quality.²⁰ There is comprehensive research about Singapore's reforms and successful education system. This research focuses on specific features of Singapore's education system which would benefit other countries if they can modify these features with their system and culture. Additionally, this research analyzes the 2018 reform of the Ministry of Education which has not been researched well yet.

Methodology

This research paper is based primarily on content policy analysis and qualitative data to understand Singapore's successful approach to education. The purpose of doing Singapore policy analyses is to understand what worked well and what did not work well and finally propose characteristics of Singapore education policy that other countries can implement. Qualitative data was conducted virtually in March 2021 across Singapore with three teachers and two parents. The paper aims to learn about Singaporean education from people who teach there and open our educational success theory. The following is the sampling criteria of the study:

1. This study will be limited only to Singaporean-based teachers and parents to understand Singapore's system and success in education.

²⁰Loh, Jason & Hu, Guangwei. (2019). Teacher Education in Singapore. 10.1093/acrefore/9780190264093.013.293.

2. The teachers' participants in this study will have teaching experience or starting their teaching careers recently in primary education. Chosen teachers have different years of experience and teaching different subjects.
3. The parents' participation in this study should have children in primary schools.

In total, there were three qualitative data interviews. The main research tools for data collection are teachers and parents who do not connect with this research's author. The next source of this research paper will rely on internet interviews and documentaries which have already been shot. As part of interviews, three teachers are accepted to give their view of the education system, and two of them are also parents, so they answered some questions as a parent. The names of teachers are different from the original one and chosen randomly because of anonymity. They are Emma, Harley, and Rachel. They are working in different schools, and they have different experience years in teaching. Emma has two kids in primary school and works as an art teacher for almost ten years. Harley has four children and works in primary school as a math and English teacher for 20 years. She mainly teaches students from P1, P2, P3 (P=primary) ages from seven to nine. Finally, Rachel started her career just two months ago and did not have children. She works as a math and English teacher. All of them are native Singaporeans, born and raised, and got their whole education in Singapore. These teachers were experiencing different phases of education policies and reforms in Singapore. They answered questions about the education system, their careers and regular work week, student stress and examination, and teachers' leadership.

Education Policy and Teachers' Views

In the research evaluation, the lack of education policy materials is one of the obstacles. The education guidelines and policy documents are only available for Singapore citizens, not for foreigners. As a result, this part of the research mainly relies on the MOE website, Education Minister's speeches, some brochures for parents who will send their children to primary school, a documentary called "A quiet revolution: Singapore's world-class educational system" and as well as teachers' and parents' interviews. Education Minister Ong Ye Kung gave a speech in 2018 at the MOE's School Work Plan seminar. His speech was analyzed and supported by two parents' and three teachers' interviews in this part. The reason for choosing Minister Ong Ye Kung's speech is because the policy phases were already analyzed in the earlier part of this research, and his speech covered the latest changes in the education of Singapore.

Reducing Examinations

Minister Ong Ye Kung talked about changes needed to uplift young Singaporean life and prepare them for the future in 2018 at MOE's School Work Plan seminar. He especially noted that the MOE and government did not change for the sake of change. They stick to their core values and mission, and at the same time, they try to catch up with globalization. He introduced a new idea which he named "Learn for life." Minister underlines the stress students experience during exams. Because of the fast-changing world, nowadays people feel inadequate. He said, "Our main challenge is how to balance rigor and joy of learning in school from an early stage." He stressed that there is no need to further phases for the education system or policy, but the government and MOE should make some modifications.

Regarding students' examinations and stress, Emma said that students feel much pressure during exam time. The parents and people of Singapore have the ideology of success, and it also increases students' anxiety because, at the end of primary school, they had to give PSLE and choose their appropriate streamline. However, this year MOE removed the streamline, which according to her has advantages and disadvantages. The advantages are no more division among students, and it will help them morally and physiologically. The disadvantage is there will be mixed class, and teachers should facilitate all knowledge levels of students in one class from the weakest to the best. She mentioned that "It is fewer than before. It is better than in my time. It was really hard. If I have a math teacher like current teachers, I will ace my exam in math always before. The good part about Singapore is that we are systematic, but it will be less stressful." As a teacher and a parent, she agreed that examination is less stressful compared to her time.

On the other hand, Harley and Rachel mentioned more minor examinations than even their time. Harley explained it as that there are pros and cons of examination. The teacher and parents see students' level in academics and non-academics. Of course, examinations put much pressure on students. However, in Singapore, the MOE removed Primary exams to decrease anxiety and increase their soft skills. According to Harley it is a really demanding education system and competitive compared to her time 30 years ago and expectations are high globally. There are four terms in a year. Lower primary does not have assessments, P3, P4, P5 have two assessments, higher primary four assessments and the last one is PSLE.

Rachel gave her thought, "First, it was stressful, but now it has changed. I know that before there were many exams. Now P1 P2, we do not have assessments, just light tests so we can prepare our lesson plan. At the end of each term (four terms), we test all the concepts we teach. Education assessments are not as stressful as in Korea because there is only one exam in Korea. My parents

are from Korea, and they say that it is really stressful when you have only one exam during your whole school years. Assessment is good, and it prepares you next year.” It is not surprising that examinations make students stressful, and one example is Korean strict exam-based system as Rachel mentioned.

From the parent side, Emma said that her children feel stress, but she does not push them to do much homework because she will kill their enthusiasm. She doesn't want her children to study at their university in Singapore. She thinks that the universities in Singapore do not improve students' critical thinking, and it will be a problem for their future. However, according to Harley, Singapore is the best place to get an education for her children: "I want them to continue their education in Singapore because it is successful, and the system is different. The content might be competent, but some skills are lacking because it is more academic in Singapore. They could not adopt other countries' systems. Also, Singapore is safe, no drugs and influence for teenagers". Both parents agree that the Singapore education system is not great when it comes to critical thinking.

Efficiency

In this part, according to PISA 2015 I analyzed former Education Minister Ong Ye Kung's speech in 2018 at the MOE's School Work Plan seminar in order to understand student's learning efficiency. Figure 1 shows the PISA science score of Singapore, which is 555 higher than the average (500). However, figure 2 shows score points in science for per hour of total learning time. It is even lower (425) than the average of OECD (450) scores. He mentioned that this represents that Singaporean students spend much time studying, but they also gain it back as a higher score in PISA. According to the Minister of Education, Ong Ye Kung, Singapore kids spend much time on their homework and tuition to achieve high scores in national and international assessments.

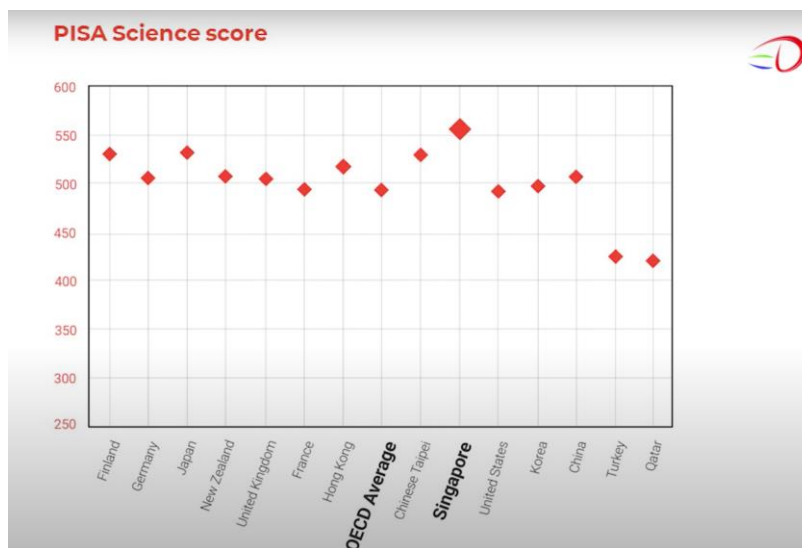
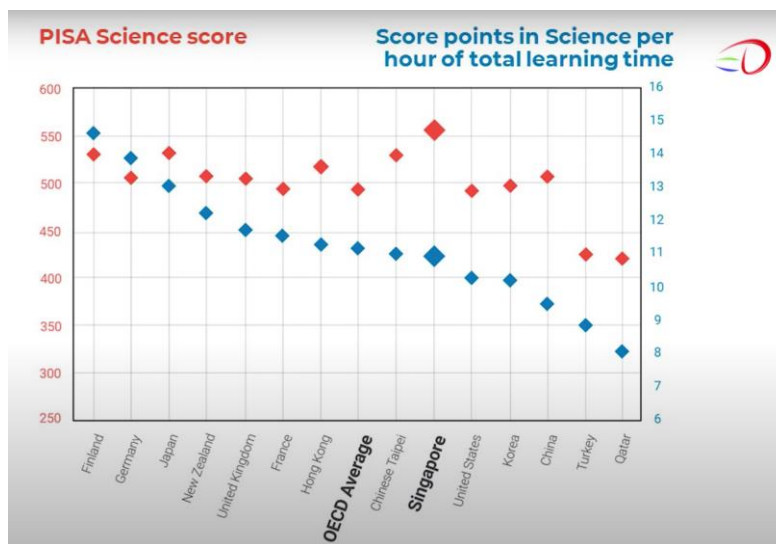
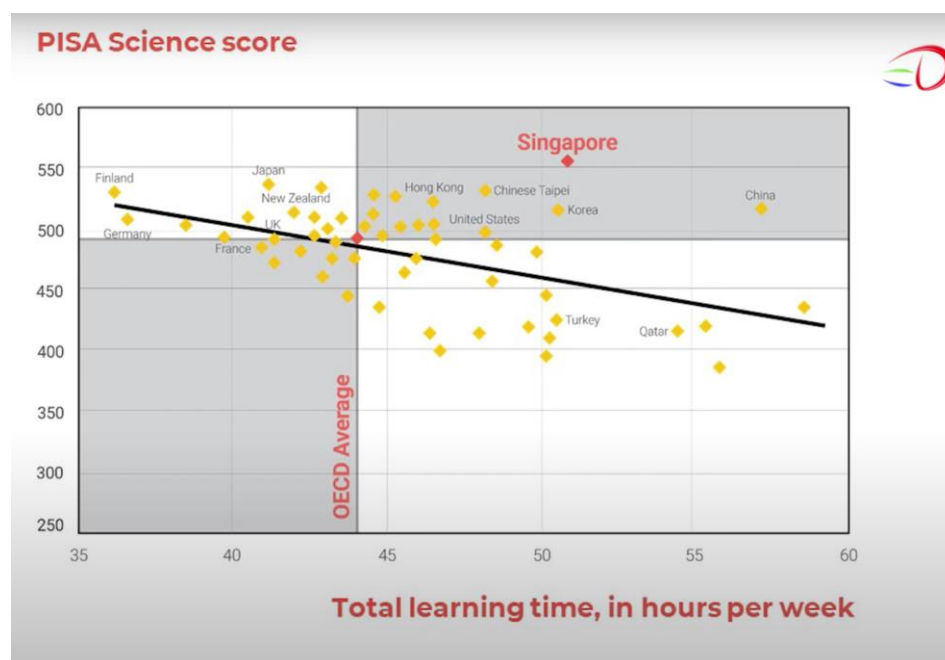
Figure 1: PISA Science Score of Singapore in 2015**Figure 2** Score point in Science per hour of total learning time

Figure 3 presents that spending more time on study creates less productivity, but in the case of Singapore, it shows an adverse effect. However, the MOE and Singapore government want to inspire kids to learn their responsibility and self-assessments. To encourage students, especially young learners, to enjoy their school life and learning responsibility, MOE discussed some changes

in the 2018 seminar. There is no room to decrease the curriculum; instead, there is a cut in assessments and tuition. In 2010 with the recommendation of the Primary Education Review and Implementation Committee (PERI), P1 mid and end-year exams were removed. The MOE is also working on removing other grades' end and mid-year exams in order to give teachers more free time to work with students without rushing the preparation of exams.

Figure: 3: Total learning time, in hours per week



The next change the Minister discussed in the 2018 seminar and introduced is about learning methods and the role of parents in those new changes. MOE encourages teachers and schools not to do additional tests or assessments instead of end and mid-year exams which MOE removed. Applying inquiry-based learning is also vital for creating students' holistic development. Inquiry-based learning methods help students to discuss, brainstorm and even find genius ways to solve problems. Minister underlined that teachers should not teach the formula beforehand. They should give students time to work on it and find their solving ways. In these new changes, the role of parents is undeniable because Minister Ong Ye Kung emphasized that sometimes when he visits

schools, students express that school assessments are not overwhelming, but the tuition and extra activities, courses they have after school are too overwhelming, and they could not get a good amount of rest.

All three teachers supported the Minister's idea that not the school assessments, but the parents are giving more stress and anxiety to their children. Because there is an attitude towards success in Singapore, most parents think that if you are not working and studying hard, you will not be successful in your education and work. Rachel mentioned: "Parents push children to do a lot of homework. Parents believe that if you work really hard, you can achieve success. Parents' mindset affects students." According to my own observation and from teachers' view, Singapore people mainly come from poor countries, and they only see that working hard will change their lives. Also, having meritocracy in the country affects it.

Teachers also give their view on teachers' preparation, working day, and curriculum. During the COVID-19 pandemic, they start their class at 7:30 and finish at 1:00 pm, but after the class, they stay for extracurricular activities and plan their class. They can finish their workday at 6:30 pm at the latest. Furthermore, the daily working time depends on which track you are in because there are two tracks at school for teachers: managerial and teaching. The grades, workloads, and salary depend on these two tracks. You can increase this track like an ordinary teacher to a senior teacher then a lead teacher finally lead-master teacher or a teacher to a head department then to a director. The teaching hiring process starts with your application. Graduating from university is not enough to be a teacher. When you apply for a teaching position, they send you to different training. Emma said, "When you sign-up to be a teacher they send you training about children, voice, teaching etc. When you finish, you will be in real life. You will have mentor

teachers who support you because you are beginning. The best thing about teacher education and also education Singapore is support. We always support each other at school."

Curriculum

Teachers expressed that MOE gives guidelines to them that cover the skills and topics students should acquire at the end of each year regarding curriculum and teaching materials. It depends on the school and teachers how to give additional materials in order to support learning. The following are the teachers' thoughts about curriculum.

According to Emma and Rachel, MOE provides guidance for students' skills which they should know at the end of the year. Supplementary materials will provide, but teachers can use their own material as long as they achieve MOE requirements at the end of the year. MOE guidelines are given to follow. Schools create their own content based on MOE guidelines. They provide the teacher with a very quiet detailed lesson plan.

Education Rights

In the legal framework, Singapore considers all citizens as equal, and no discrimination against any citizen of Singapore based on their religion, race, descent, or place of birth. Because Singapore consists of multiple religions, each religious group can request permission to open institutions to educate their religious children. Compulsory education was launched in 2003 under the Compulsory Education Act (CEA), which covers six years of compulsory primary education. According to the former Education Minister Tharman Shanmugaeernam, regardless of students' family income background, all students have the right to get free and also quality education. The education system is mainly based on meritocracy, where secondary school admission depends on examination results (PSLE). Regardless of the school type, all schools experience annual financial audits by MOE. The teachers in Singapore are mainly hired by MOE and divided into teachers

with qualifications and without qualifications. All of them have access to the National Instruction Manual, which describes everything related to curriculum content and schools.

Lessons and Challenges

According to all of the analyses made in this research, some lessons should be taken from Singapore's educational success. The continuous improvement and being one of the top performers with multiple ethnicities make some of Singapore's educational characteristics ideal for many countries. It should be argued that Singapore is a small-scale country and mainly controlled by the government, which seems inapplicable; however, there are many states and countries the size of Singapore. There is no exact formula for success but observing the top countries and looking for ways to implement their successes in other countries will be the best way. However, adopting one system would not be enough. There are multiple features countries should consider. In this part, these features will be discussed. Some major lesson from Singapore success are as follows:

Continued improvement

People always refer to Singapore as a heavily government-controlled country, but this control is divided into different departments and works closely. It is clear that the government controls everything, however not in a careless way; they have a connection with all departments. When Singapore introduces an educational reform, they always do it systematically, in multiple steps. Firstly, the pilot changes in a few schools, observe their effects, apply corrections and then roll out to more schools. Even after the changes are fully introduced, they continue to observe, get feedback from teachers, parents, students, analyze test results, and address shortcomings. This

continuous improvement approach allows Singapore to guarantee the success of its education system on an ongoing basis.

Managing human resources

Singapore is one of the top leaders when it comes to choosing the right people for the right job. In the 1990s, policymakers acted continuously and deliberately to create a structure for human resources from teacher to principals hiring system. It is crucial to understand that teachers and school officials are the leading role players in a successful education system. The Singapore education system not only focuses on teachers' education but also creates a comprehensive system for hiring, training, compensating, self and professional development.

In the recruitment process, Singapore selects teachers from top graduates of universities. Teachers' academic commitment and communication with students are the key features. Potential teacher candidates do their internship even starting from their high school. According to the teacher, Rachel, they are called student teachers. Potential teachers apply for jobs through MOE, and after passing interviews, they get teacher training. This is not the final training in teachers' careers. Every year they also take 100 hours of training by MOE in order to improve themselves. It differs from school to school, but some schools also suggest professional development courses, which the MOE does not require.

Teachers' compensation depends on their experience. Year after year, as teachers teach higher classes, for example, from P1 to P2, salary increases. It is also essential for their professional development because a teacher belongs to either the managerial or teaching track; they should raise in the track. Having high-quality teachers and good performance is also required to be influential school leaders.

Close cross-department collaboration

In order to have an effective system and smooth integration process, there is a need for a close cooperation between all the state departments. In Singapore, the MOE is responsible for policy developments. On the other hand, in the implementation and research part, the National Institute of Education (NIE) works closely with teachers and school principals to identify and analyze what works and what does not work in every adopted policy. The NIE also involves discussions of MOE which makes the process easy for them. NIE is also responsible for training high-quality teachers.

It can be beneficial to understand how this cooperation works among the MOE, NIE, and school professionals. The best example would be how Singapore transferred from purely knowledge-based education to creative learning, which covers the “Thinking Schools, learning nation” and “Teach Less, Learn More” initiative. This initiative improved by the constant discussion and research analyzed with the MOE and the NIE. The NIE worked closely with teachers to identify which way is effective for students. The MOE also invests in a long-term project inside the NIE called the Centre for Research in Pedagogy and Practice. This project covers various teaching practices with teachers. With the participation of multiple state departments, they manage to find a strong path to introduce, execute and ensure the success of the introduced policy. Due to bureaucratic reasons, this type of collaboration might be hard to achieve, but it is necessary for bringing policies into realization.

Equity, meritocracy, accountability

After gaining independence, Singapore had not only educational but also social problems between multi-ethnic populations. There was a high level of gap between the Chinese and Tamil/Malay population in attendance and achievement. Officials saw that this also would trigger

political stability and independence from other countries. Lee Kuan Yew's government started to close the gap between these ethnicities both socially and educationally. According to Professor Lee, the only way to close this gap is to create equal rights for all ethnicities. Each ethnicity has its community that may seek additional support from the government. These communities and governments identify poor and single parents' families and support them to close the gap. The government also worked on the housing system, and today over 80 percent of people have their own house in a government-built building with different ethnicities living mixed in every building.

According to the teacher's interview, Harley mentioned that living together with different ethnicities makes our children understand their religion and tradition. She said that all ethnicities have great respect for each other and celebrate each other's traditional and religious holidays. "Our children understand that when they are home acting as their ethnicity is appropriate, and however at school or other places, they know that all people are equal and the same.

On the education side, the meritocratic system has a significant impact on improving discrimination. The primary tool for meritocracy is the examination system because each year, six out of 10 low-income families' children go to quality secondary schools or universities. The streamlining system also helps to close discrimination putting children according to their exam results, and as a result, every child has a place to go.

Regarding school accountability, all schools are responsible in front of parents, the government, and the MOE. As mentioned in the literature review, school principals believe that they should report their results at the end of each year so that the government and parents could know how well their children get an education and where they spend their money.

Challenges

Singapore implements many policies correctly, such as constant improvement iteration, human management system, close collaboration, equity, meritocracy, and accountability. However, there are some challenges they are facing nowadays. These challenges were created from the formation of their education system, and currently, MOE aims to remove these obstacles:

1. The cornerstone of the Singapore education system is the examinations and assessments. It means that there are many tests that students take mid and end of the school year. There are many hours spent reviewing for these exams, and it puts anxiety on children.
2. The classrooms are mainly controlled by teachers. Teachers-driven classrooms put obstacles towards students' discussion, and students get an education with a lack of giving and thinking on their views.
3. Because of teacher-driven classrooms, there is no discussion among students, and they are deficient in critical thinking skills. It also affects their other soft skills, and when compared to other foreign countries, they are on top with academic skills but not soft skills.

Knowing all of these challenges, the MOE improves their system by removing assessment, improving teachers' pedagogy and implementing the inquiry method.

Conclusion

Teachers play a critical role in the success of students. Other countries can improve how their school system helps their students first by ensuring their teachers are skilled and well-prepared to teach. In many countries, teaching is not seen as a prestigious occupation anymore. Countries can learn from Singapore about how to make teaching an attractive occupation, with

growth opportunities. From the teachers' interview, I understand that having and producing good teachers at schools and universities is key to success. Teachers are the people who are working with youth and children. Additionally, with the advance of technology, education is one of the fields that has been changing in the last 30 years. Singapore ensures teachers become lifelong learners and gain new skills to teach in the best ways possible. In this regard, other countries should prepare their teachers for the latest changes by putting a system in place to improve teachers' knowledge and skills.

Another essential feature to learn from Singapore is how to introduce reforms. Every country has its unique culture and attributes, and states should take this into account while introducing reforms. If the reforms are applied without a systematic approach, they are less likely to succeed. Singapore has rolled out reforms in multiple steps, starting with piloting in a few schools and then in more and more schools. Furthermore, during this process, they have always taken feedback from teachers, parents, and students and improved. Improving the quality of education requires long-term thinking with patience.

Finally, there is no one-fit-all education system recipe. However, the best action to take to improve the education quality of a nation is to learn from successful countries' characteristics and apply them within the country, considering particular cultures and societies. Culture and society are crucial when implementing policies. Attempting to copy and paste a reform does not produce expected results. Giving attention to all of Singapore's successful features achieved all these years and challenges facing, countries should get critical parts of their success and learn from their mistakes.

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