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Means to an End: A Comparative Review of Finland and Singapore's Basic Education Systems

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Abstract

Singapore and Finland, despite having very different approaches to basic education, both perform highly in standardized testing and are respected internationally for their education systems. This paper takes a policy-planning view in analysing what makes these systems tick, looking specifically for similarities in these contrasting systems, or a "different process same outcome" approach. This means focusing on factors that can be affected via policy means. By doing this, factors that contribute to academic excellence are isolated, given that they remain as constants even when the surrounding conditions are changed dramatically. Analysis shown reveals that many "popular" categories, such as homework, class size and even educational philosophy, all of which are wildly different when comparing Singapore and Finland, are not unique to good education systems. Rather, when stable political, social and economic climates are assumed, what matters is structural cohesiveness within the education hierarchy, and a high overall quality of teachers, which can be achieved through a robust training and recruitment program along with powerful incentives to keep them in the industry, if not the career. Finally, this paper presents a model detailing the necessary conditions for a good education system to exist, as well as some measures that can be taken to improve it.

Keywords: Singapore, Finland, Education, Policy, Planning, Teachers, Evaluation

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1. Introduction

Education is currently one of the most important issues in the world today. The UN's Human Development Index includes education as one of its key variables, and one key topic typically mentioned during discourse regarding developed and developing countries is the level of education. This is, however, not to say that developed nations have their education figured out – The US, for example, by all accounts, is a middling nation in terms of its education system compared with other countries, while the UK also struggles with churning out top talent from its education system. While the HDI draws its education index from years of education, the gaping hole in that measurement comes from the *quality* of the education. While the duration of education is definitely important, education during the formative years of a child's life, when he learns faster, more easily, and is more open to influence, is arguably more important than the presence of tertiary education.

Singapore and Finland are two countries that have endured similar situations in their developing years. In 1960, Finland was still 60% rural (OECD, 2010) and less than 10% of students studied beyond grammar school (PISA, 2006). Meanwhile, Singapore had only become an independent country in 1965, with an education system that was still divided along racial lines and over 20% of students dropping out of school before they could finish secondary education (Goh & Gopinathan, 2006). Despite these adverse conditions a scant fifty years ago, Singapore and Finland are two countries that score extremely highly on OECD's, which also takes into account different PISA test scores, such as mathematics, problem solving and language proficiency. Additionally, both Singapore and Finland also have highly-ranked "resilience" scores, which measures a student's test results against his expected performance according to socioeconomic status (OECD, 2012). In other words, students from both these countries are outperforming their stature. The most interesting point of conflict here is in the fact that Singapore and Finland have widely lauded but also vastly different education systems, suggesting that there are many ways to educate children but still produce favourable results. While Singapore's system is extremely rigorous and exam-heavy, it is also systematic and well-formulated, as the results speak for themselves. Finland, on the other hand, emphasises equality in standards, boasting the lowest difference in test score between strong and weak students while still maintaining a high mean.

The aim of this paper, then, is to find out how both education systems have achieved large amounts of success despite very large differences in philosophy and systems. This leads us to my research question: **What are the similarities between Singapore and Finland's basic education infrastructure, and how do they work towards helping students to excel?** I will be examining this based on factors I have divided into three different groups: school infrastructure and policy, non-education conditions, and teacher policy.

Firstly, school infrastructure and policy refers broadly to the way basic education is structured and immediate conditions in the classroom. Non-education conditions refers to things outside of the jurisdiction of education policy that nevertheless still retain the power to affect learning ability and test results of children. Finally, teacher policy refers to the policies and conditions teachers work under, and may need a little more justification. I have chosen to focus on teachers because they are the group that has the most direct impact on learning of children. The infrastructure for teachers thus has many aspects to it, which can also divided into sub-categories. This paper will first explain the education systems of Singapore and Finland to provide a background picture – This is also important because it emphasises the different conditions under which teachers in both countries operate in. It will then discuss policy matters that directly affect teachers, which can also be broadly divided into five categories – **Financing, Recruitment and Training, Talent Retention, Autonomy** and **Appraisal**. Where suitable, I will also be making comparisons to other countries. Finally, I will truncate all this information, and use the similarities that do exist between the education systems of Singapore and Finland to build a model that charts the essential steps toward building a good education system.

2. Literature Review

In discussing what makes an education system "good", the meaning of "good" becomes hotly contested. Is it one that makes the happiest, the smartest, or the most hardworking students? The highest rate of tertiary graduation? Many of these barometers are not entirely predicated solely on an education system, which is natural – Education is a part of society after all. What I do want to focus on, however, is what the education system can do for children. As a result, I am going back to Jeffrey Leiter and David Street's definition of what an education system should be able to do (1979): The basic goals of an education system is to provide equal opportunities to education, regardless of exogenous factors such as race and parental wealth, ensure a high level of general competence and recognises excellent talent.

There are many things that can help or hinder a student's learning process. Among them, many of them take place in the classroom, such as student-teacher social interactions (both social and academic), classroom assessment, instruction and support and maintenance of student participation (Wang, Heartel, & Walberg, 1997). This would indicate that teachers have a large part to play in the role of educating students, as people would expect. In fact, other research has indicated that differences in teacher quality are the most relevant in influencing student achievement when compared to other factors, such as class size, streaming, or the amount of homework (Toh, Ho, Riley, & Hoh, 2006). According to Wayne and Youngs (2003), there exists a substantial relationship between student achievement and the teacher teaching the students. Timperley and Alton-Lee have also advanced the argument that there are marked relationships between teachers and student results (Timberley & Alton-Lee, 2008). It is also estimated that switching from a poor teacher to an average teacher can have effects that transition in adulthood: Students with better teachers are more likely to go to college, earn higher salaries, have higher savings going into retirement, and have an increased lifetime income of $250,000 (Chetty, Friedman, & Rockoff, 2014) on average.

Teachers are, however, not the only indicator affecting student performance. There are also a bevy of factors that can also affect a student's performance that lie outside the jurisdiction of the academic system, into other facets of governance or even outside of it. These can include drastic factors that may affect the government's ability to even build a school, such as war or other forms of civil unrest and geographical conditions as well, though these primarily affect developing countries. Students' physical and mental health also affect their performances (Moore, Wehby, Hollo, Robertson, & Maggin, 2014), though it can also be argued that physical and mental health are also influenced by a variety of other factors. Rather, Moore also mentions that medical attention in schools are also lacking, both in terms of treatment (being sent to the school nurse) or detection and intervention. The issue of socioeconomic status seems to be the big one. Biological arguments aside, while it is commonly accepted that there is a close link between socioeconomic status and student achievement, there are equally common disputes over what exactly "socioeconomic" means (Sirin, 2005), and the strength of the link also depends on which indicators are used. Common variables used include school and residence location, parents' income, parents' education (which can be further separated into father's and mother's income and education), home resources (such as the availability of books, computers and other learning aids) and minority status, which in

some other studies is potentially problematically classified as "race". High degrees of social unrest will affect students' ability to learn and grow as well, bringing up issues such as birth risks, undereducated parents, homelessness and maltreatment, though interestingly poverty and race are not issues once these risk factors are taken away (Fatuzzo, Leboeuf, & Rouse, 2013). The common trend in all these potential variables that have been used are basically different ways of measuring the availability of resources to students' learning and how they affect the ability of a student to learn. In the absence of those things, having classmates with those resources will also help, either through positive influence or sharing of resources (Chiu & Chow, 2015) Part of the reason this is important is because it links educational outcomes to greater problems in society, such as economic segregation and stratification (Sirin, 2005). For the same reason, some educational indices measure not only mean test scores of students, but also the "equality" of test scores, or the gap between the average test scores with the highest, and more importantly, lowest test scores. In the sphere of welfare policies, equality can be measured either in terms of equal opportunities or equal outcomes. Socioeconomic segregation in education ensures that a child has access to neither.

On the topic of how evaluation should be conducted, Cort (1970) provides us with an old, but extensive list which makes a lot of sense. Firstly, his aims are congruent with those expressed earlier by Leither and Street, where the goals are equal opportunity, high competence and recognition of excellence. He also expresses a fourth goal in student mobility, that the system should be able to adjust according to the needs of the students, changes in their academic capability(such as mobility between poorer or better classes) or special talents that they develop. Secondly, evaluation can occur on up to four levels- Students, teachers, programs and schools. Thirdly, he list ideal functions for evaluations to achieve. The important ones to this paper are as follows – The evaluation it must integrate and organise information and recommendations from a number of levels in the systemic hierarchy, be capable of distinguishing among varying educationally relevant conditions, serve to facilitate change and improvement and be informative to a wide variety of audiences. I selected these conditions because my evaluation of Singapore and Finland's education systems is not performed with the goal of suggesting change for either system, or be of any policy-related consequence to either of these nations – The goal is to identify general factors that are common to high-performing education systems. Another interesting dimension regarding high-performing education systems is the trajectory, or the "stage" of evolution that particular

education system is at – Depending on whether the education system is trying to move from being average to good or from being good to great, the interventions are vastly different. Poorer systems tend to rely more closely to tight control and central planning, while good systems that are trying to improve try to increase autonomy, flexibility and increase career paths for teachers (Mourshed, Chijioke, & Barber, 2010). This may suggest that Singapore and Finland are at different stages of their evolution.

However, not every issue surrounding student achievement (or the lack of it) can be solved through fiscal means. Interestingly, a child's sociometric status, which measures how much he is liked or disliked in a group, seems to play a part in student achievement as well (Soponaru, Tincu, & Iorga, 2014). This is directly associated with bullying. The trend of self-esteem is also apparent, if not more critical, in a study indicating the parental influence and motivational techniques has a strong correlation with a child's academic achievement (Ing, 2014). The same study also mentions that while less strong, parental influence can also translate to better attitudes later on in life, most notable persistence, which is important in "more difficult" disciplines such as science, technology, engineering and mathematics. Many of the top-ranking countries are East Asian, which has led to a popular view that Asian familial and work values can be attributing towards academic excellence. However, this information is not very useful for two reasons. The first and more general view is that deeply embedded cultural values that tend to occur at different magnitudes, even within households, are difficult to both implement and dispel from a policy perspective. Secondly, there is a link between "Asian" values and mental health which can be quite disconcerting (Liao & Wei, 2014). Aside from that, Olson(2004) mentions two poignant things about research surrounding student achievement: Firstly, the subject area is incredibly problematic not because of a lack of research, but the abundance of research with an absence of a universal truth or concrete results – What may facilitate student achievement in one place may turn out to be absolutely disastrous in another. Secondly, the reason behind this is because of the diverse amount of potential affecting factors when it comes to student achievement, and whether situational laws can be applied even slightly less narrowly than the specific case in question is a difficult proposition.

3. Motivation

Having spent most of my life as a consumer of education systems, and as an economist and social scientist by training, I am very interested in how different parts of society contribute to a more productive nation. Of different initiatives geared toward such a goal, such as infrastructure, labour retraining and even sanitation, education is the one that has left the deepest impression on me. In financial terms, education policy is a long-term investment – Governments typically invest in public schools, examination boards and policy committees among other things for upwards of ten years, or however long basic education is in each country's context, with the goal of equipping children with useful requisite skills with which they can enter the workforce and be productive. Yet, levels of public spending in education have shown to have very little to do with education. For example, within the top spenders in education as a percentage of annual GDP, some of them are in the top rungs of academic excellence – South Korea ranks 2nd at 24.98%, Singapore is 4th at 20.52%, while Hong Kong and Switzerland come in 9th and 10th at 17.43% and 15.9% respectively. Conversely, Finland, the other country in this case study, comes in at 18th with a lowly 12% of GDP being spent on Education, while Japan, one of the strongest countries in test scores, coming in close to the bottom at 9.71%, with the Netherlands, a strong European performer, not spending much more. The other highest spenders are Ghana, Thailand, Mexico, South Africa and Chile – not countries that are highly lauded for their academic excellence (Pearson, 2014). The obvious conclusion to be made here is that while public spending on education might matter somewhat, the more important detail is that the way in which the money is spent matters more. This then leads me to the idea of exploring education policies – Some countries are certainly doing better than others when we consider the spending-to-output ratio – This is important when we consider that governments also want to use taxpayers' money as efficiently as possible. While every country has different objectives for education, they are all broadly similar – to produce intelligent, confident, well-minded students, for example (the definition of well-minded may differ here, depending on the overarching philosophy governing the country). What is interesting is that despite a lot of the research emphasising a system based on feedback loops, collaborative learning and catering to students (Rennet-Ariev, 2005), the best-performing education systems in the world are from East Asian countries, which are notorious for doing the exact opposite.

The importance of education is somehow both publicised and understated. Many nations acknowledge the importance of education, developing a link from early education to later

skills in the workplace. More importantly, while the role of adult education can be seen as useful in reconfiguring the workforce away from structural unemployment, skills are much more easily acquired in early education, which leads me to my focus in basic education. As mentioned earlier, there are a multitude of factors that can affect the quality of our education. However, when we talk about usefulness or feasibility, not many of them can be changed easily, if at all. Hence, this paper will focus primarily on policy issues surrounding the education sector in my comparison. However, most of the available literature addresses specific parts of the education department, such as the teachers, principals or supporting staff, without integrating these departments together or discusses external factors that exist outside of the system – Which leads me to an attempt to construct my own model instead.

I am comparing Finland to Singapore is simply this – Compared to Singapore's formulaic and reputedly stressful education system, Finland's education policy, with its lack of standardised testing and absence of homework, feels very alien and almost too good to be true. Yet, this is not a comparison to gauge superiority – That is always subjective and never-ending. Instead, what I do want to examine is the fact that despite radically different education policies and even a radically different education philosophy, both countries are still doing quite well academically. Hence, I believe there has to be some similarity buried deep within all the diversity. In the process of writing this paper, as mentioned before, I hope to identify the essential factor or factors to academic achievement in children. This is useful not just for the countries in question, but for education systems globally, both public and private (but probably more public because I will be examining this on a policy level).

4. Methodology

For the purposes of this paper, I will be using a "Different but Same Outcome" approach – In other circles, this may also be known as Most Different Systems Design(MDSD) (Faure, 1994), or Method of Agreement (Murakami, 2013). Essentially, by comparing two cases that are as different as possible but have the same outcomes, I hope to filter out as many independent variables as I can that helps these cases arrive at these outcomes. In the context of this paper, I will thus be comparing issues in and out of Singapore and Finland's education systems to omit as many potential explanatory variables as possible. By doing this, I can thus hone in on the similarities between the two systems as an essential factor toward academic excellence.

In determining what aforementioned "academic excellence" refers to in the context of education systems, there are three widely accepted indicators of academic excellence. Firstly, I elected not to use the UN's education index, which is a component of its Human Development Index (HDI), due to the fact that the education index is a measure of mean and expected years of education. Aside from this paper being about basic education, years of education also does little to explain quality of education, especially in children. The second and most commonly used indicator is the Program for International Student Assessment (PISA) test scores, administered by the Organisation of Economic Co-operation and Development (OECD). PISA tests focus primarily on mathematics, with reading, problem-solving and financial literacy also included the latter on an optional basis. There are many reasons I favour PISA and other international test scores over national test scores. Firstly, the subject areas that the PISA tests covers are directly related to the true purpose of education beyond simple subjects. Secondly, I favour the focus on mathematics because mathematics generally has the most homogenous syllabus internationally; The same cannot be said of reading, due to differing standards of English globally and difficulty of native languages being taken into account among other things, such as the existence of large dialect groups, while problem-solving is more holistic and abstract and financial literacy, while important and also a subset of mathematics, does not have a specific subject dedicated to it, and education systems in many countries, especially the developing ones, not agreeing on its importance alongside other educational goals. Thirdly, the process in which PISA test scores are calculated is highly meticulous, and takes into account many factors that may skew the test results. For example, different weight adjustments are made both between schools and within schools based on non-response rate and population size, among other things (OECD, PISA 2012 Technical Report, 2014).

The final indicator I use to judge academic excellence is Pearson and the Economist Intelligence Unit (EIU)'s The Learning Curve Index, which combines national data and a few international rankings, including PISA, TIMSS and PIRLS to provide a ranking system that measures how international education systems are performing relative to each other. The Learning Curve Index differs slightly from PISA scores in that it is a combination of two underlying indices. Firstly, cognitive skills are calculated by using PISA, TIMSS and PIRLS scores in reading, math and science. Secondly, educational attainment is measured using literacy and graduation rates.

While the Learning Curve Index (LCI) is intuitively a good measure, and I like the fact that it measures skills instead of proficiencies, it has certain advantages and disadvantages over PISA scores. Firstly, while PISA tests are administered to fifteen-year-olds, the LCI is calculated using samples from students in grade 4 and grade 8. This means that the LCI draws its information from respondents based on the level of academic attainment, instead of age, which is arguably a good thing. Secondly, I find the use of graduation rates problematic as graduation stringency differs across countries – For example, while less than 30% of the student population in Singapore qualify to enter a local university, the rate of university entrance in Finland and many countries in Western Europe are a lot higher. Thirdly, the main distinction between the LCI and PISA scores lies in the LCI's large number of indicators, broadly divided into three groups: Inputs to Education (such as student-teacher ratio, student life expectancy and education spending), outputs of education (for example, unemployment by educational attainment, test scores and labour market productivity) and socio-economic indicators (unemployment, crime rates, social inequality and GDP per capita, among others) (EIU, 2012). This is very close to my interests in this paper, and I will be using some amount of data from the LCI in this paper. Regardless, both the LCI and PISA scores have Singapore and Finland placed relatively high – the LCI places Singapore at 3rd and Finland at 5th place currently, while PISA test scores rank Singapore at 3rd and Finland at 11th, with performances significantly above the OECD average. While I could go on and on about which index I should be using, both indices capture accurate the point I wanted to make, that both Singapore and Finland are academically strong.

There are a few criticisms against using test results as a metric of student achievement. The first is that test results in itself, given its focus on academic results, do not capture the full extent of the success the education system is supposed to achieve, such as holistic, personal and social development. That much is clear. The extension of this criticism also hinges on the future of education if test results continue to be the dominant mode of assessment for schools – the message sent to teachers is that the primary goal of their occupation is to raise student test results, which then skews the system away from child development and engagement. The term "engagement" is one that is particularly intriguing – It is supposed to refer to a child's development outside of academics. For example, children with high levels of extracurricular involvement at school are less likely to drop out (Jones, 1999). The main issue surrounding the problem is that development of tools to measure academic achievement are far more advanced than tools to measure engagement. Without such tools, and no readily available

data, I will still opt to use test results as my primary measure of student achievement, though I will also mention extracurricular involvement in relation to holistic student development.

In comparing aspects of education between Singapore and Finland, I will be using quantitative statistics whenever they are applicable from internationally trusted sources such as OECD, the UN and Pearson. Where more qualitative analysis is required, such as descriptions of classroom conditions and teaching pedagogy, I will be using a wider range of material. Academic journals are generally given priority by their status, although I will also use documentaries, interviews and news articles where they do not suffice. The reason I am willing to go into discourse analysis at some points is their ease of access, as well as the fact that they are generally more understandable as anecdotes when it comes to painting a picture of classroom conditions. For the sake of clarity, I will also first elaborate on why that particular aspect may or should be important in contributing or diminishing classroom excellence. As much of the theory differs quite heavily between aspects, I will elaborate on the theory behind each aspect in their individual sub-sections before consolidating an overall viewpoint at the end of the section.

Finally, for the purposes of this paper, I will only be covering schooling policies on the basic level. My definition of "basic" here refers approximately to education from the ages of 7 to 16. In Singapore, this means primary and secondary school. In Finland, this refers only to comprehensive school, which will be mentioned later on. I centre my research around this age group because this is the formative part of a child's life – when they are most prone to influence and most eligible to pick up skills and develop thinking faculties. This would make education at this stage most vital for having skilled labour in the future and also for developing complex minds.

5. Infrastructure and Education Sector-wide Policies

5.1 Education in Singapore

5.1.1 Preschool and Primary School

Pre-schooling from the age of three or four, although not mandatory, is very common in Singapore, with only 1.2% of children aged 6 and under not registered in a preschool. Compulsory schooling in Singapore begins at the age of 7, where every child enters primary school. They take classes in examinable subjects, namely English, Mathematics, Science and

Mother Tongue, but also take some classes in Arts and Crafts, Physical Education, Health Education, Civics and Moral Education and Music. After the fourth year of primary school, pupils then take classes in a scheme known as "subject-based banding", where the standard of the classes they take in the fifth and sixth year of primary school depends on their grades at the end of primary four for each respective subject. At the end of the sixth year of primary school, all students then take the Primary School Leaving Examinations (PSLE), a national exam that covers English, Mathematics, Science and their respective mother tongues. The absolute scores are then compared with other students' scores to form an aggregate score, which are then used in applications to secondary schools. Students can apply to up to six secondary schools via a centralized system, which allocates places to students to each school based on their PSLE scores, from the highest to the lowest scores. In the event that a student does not qualify for any of the schools he has selected, one will be allocated based on the students' location.

5.1.2 Secondary School

Students typically attend secondary school for four years, and are broadly streamed into four tracks based on their PSLE scores. Students in the "Special" or "Express" track culminates in the student sitting for the Cambridge 'O' level examinations at the age of 16(without any disruptions), or at the end of the fourth year of secondary school Students in the "Normal(Academic)" track do the same, but in the fifth year of secondary school. Students can take anywhere from 5 to 11 papers for their 'O' level examinations, with subjects consisting of English, E Mathematics, A Mathematics, Mother Tongue, Higher Mother Tongue, Combined Science, Physics, Chemistry, Biology, Combined Humanities, Literature, History, Geography, Music, Design and Technology, Principles of Accounting, Art or Food and Nutrition. Of these subjects, some of them are mutually exclusive: Higher Mother Tongue cannot be taken with Mother Tongue, Combined Science is a combination of Physics and Chemistry or Chemistry and Biology, and cannot be taken together with its composites. Combined Humanities consists of History, Geography or Literature and Social Studies, and also cannot be taken together with its composite papers. In practice, most students sit for 5 to 9 papers, as entry to Junior College takes into account the grades of English, one each of a science, mathematics and humanities subjects and the best 2 grades of any subject after that (for a total of 6 subjects), while entry to Polytechnic takes into account the same grades minus the humanities grade (for a total of 5 subjects). Normal (Technical) students sit for 'N'

level exams at the end of four years of secondary school. These usually are simplified versions of 'O' level papers and it is more common for students to choose more technical subjects such as Design and Technology. After that, the common options for students to take are to pursue further technical education, leave school altogether, or with good performance, to stay another year with the intention of sitting for the 'O' level examinations.

5.1.3 Post-secondary Education

Based on their 'O' level results, students are then entered into different post-secondary programs, with students with better results allowed more option for self-selection into different programs. Junior colleges represent the continuation of heavily regulated and structured teaching, where students continue to take subjects like Physics, Mathematics, Economics or Geography with the intention of going to university. Polytechnics are technical vocations that offer a large variety of different programs that utilize different technical skills, such as engineering, journalism and nursing, with the focus on being a more industry-oriented alternative to junior colleges. Students with outstanding grades can also be admitted to university. Polytechnic courses are generally three years long, compared to two years in a junior college. Institutes of Technical Education (ITEs) are also post-secondary institutes in that provide post-secondary employment training, and are typically seen as lower on the education hierarchy than polytechnics. Aside from these three main options, several private and specialized institutes exist as options for post-secondary education alternatives, such as nursing, culinary and specialist accounting schools.

5.2 Education in Finland

5.2.1 Preschool

Preschool (or kindergarten) in Finland, while not mandatory, is used almost by everyone. Preschool typically begins at the age of six, and lasts for a year before formal education begins at the age of seven to the birth year. At preschool, children are not taught formally, but instead are encouraged to interact with other children and develop social skills (Leinonen, Brotherus, & Venninen, 2014).

5.2.2 Primary and Secondary School

Instead of the division between Primary and Secondary school, students in Finland instead go to a comprehensive school from the ages of 7 to 16(with a voluntary 10^{th} year). Much unlike Singapore, schools in Finland do not have standardized testing, with evaluations in the form

of teacher-made tests and verbal assessments. In the first six years, all subjects are taught by one homeroom teacher, while from year 7 to 9, subjects are instead taught by specialized subject teachers, and can range from languages, mathematics, sciences, humanities and arts.

5.2.3 Post-secondary Education

At the end of mandatory basic schooling, students can either choose to leave school altogether, go to a vocational school(or polytechnic), or go to upper secondary school, which serves as a gateway to tertiary education. Students from vocational schools who have outstanding results may also apply to university in their respective fields. Students who go to upper secondary school then sit for the only standardized test in the school system: the National Matriculation Exam. Students are required to take the test in their mother tongue, and three other subjects out of the following four: the second national language, a foreign language, mathematics and general studies, which includes natural sciences and humanities. Of these four subjects, two levels, the basic and advanced levels are available, and at least one of the papers sat for has to be at the advanced level.

5.3 Financing

Basic schooling in Finland is free, and it is illegal for a school to charge school fees. By contrast, schooling in Singapore is not free, but heavily subsidised – Parents of children in public schools can expect to pay about S$6-12(USD$5-10) a month. Private schools do exist, however, and those can charge up to S$200-300 a month. Aside from that, while schools in Finland provide free lunches, schools in Singapore generally do not do this. Instead, every school has a canteen where students can buy their meals at a subsidized rate. However, this is not a rare phenomenon – Many other countries provide free or heavily subsidized education.

Outside from what the fees incurred by the student, public spending should be inspected as well. As mentioned earlier, the disparity between Singapore and Finland on government spending on education differs by almost 8 percentage points. However, due to the smaller class size in Finland as well as the differences in resource allocation patterns between the two countries, the difference in public spending per student as a percentage of GDP per capita has Finland exceeding Singapore by over 15 percentage points (Pearson, 2014). These

differences, while not large, are also not significant because they are both at average levels at least. It is, however, important that funding is both sufficient and well distributed if equitable services and enhanced learning experiences are to be made to students regardless of status, background or school type (Carr-Stewart, Marshall, & Steeves, 2011). As a result, it becomes inconclusive whether raw spending on education is effective in raising student achievement, as information regarding the expenditure composition is unclear so far.

5.4 Class size

Class size is a popular topic of debate amongst education professionals and researchers. According to Schanzenbach (2010), class size occupies a unique place in education policy because it represents a variable that both has a strong link to education outcomes and can be directly controlled by policy measures. It is also politically popular because it makes intuitive sense. Some of the benefits according to previous research also includes higher morale and less teacher stress, reduced teacher workloads, more individualized attention for students, increased student and teacher interaction/communication, higher levels of student participation, more time on task or greater opportunity to learn, lower retention rates and increased parent and teacher interaction/communication (Romanik, 2010). The issue of equality also comes up with evidence that class size reduction has greater effects on the academic achievement of poorer students or inferior teachers, partly because larger class sizes make it difficult for teachers to implement different teaching methods. Also, this trend seems to surpass international borders (Schanzenback, 2014), as well as being relevant even in older students (De Poala, Ponzo, & Scoppa, 2014). However, other literature also presents semi-conflicting evidence. While there is no literature that discusses the benefits of larger class sizes, the testing behind the literature that heavily advocates class size has come under great question, mostly with the conclusion that the effects of class-size reduction are greatly overstated (Chingos, 2011). Also, the notion that reducing class size brings great benefits to all students is questioned, though it is also unclear what kind of students benefit the most from reduced class sizes (Kreuger, 1999). Finally, the biggest argument against reducing class sizes is the immense amount of costs it would incur (Romanik, 2010) for an uncertain benefit, which also gives way to the notion that teacher quality is a bigger indicator of academic treatment, and that the benefits of reducing class size also should take the experience and strength of the teacher into account (Meritt, Rimm-Kaufman, Berry, Walkowiak, & Larsen, 2011). With so many arguments regarding the effectiveness of class

size, the only conclusion that can be made is that a reduced class size is a dominant option in terms of effectiveness (cost is another issue).

With that in mind, class sizes in Finland are small, usually less than 20 (OECD, 2012). By contrast, class sizes in Singapore vary widely, from 20 in the smaller schools to the low 40s in larger classes, with a mean of 33.2 students per class across primary and secondary levels (Wößmann & West, 2002). Despite literature emphasizing that smaller class sizes are more conducive for learning, Singapore's class sizes have not proven to be an obstacle in result achievement. That being said, with the absence of trials with differing class sizes within Finland or Singapore, we cannot say conclusively what class sizes is doing to either of these countries.

5.5 School Hours and Homework

There are two different reasons why increasing school hours may be good for children: Firstly, keeping children in school increases their hours of supervised time and keeps them away from "bad" influences which have the potential to lead them toward juvenile delinquency, gangs, various kinds of addiction and substance abuse, and so on. The second is the intrinsic benefit of a child staying in school longer: Increased learning. In developed countries, a strong relationship exists between academic performance and instruction hours (Lavy, 2010), though this is also dependent on many things, such as pace of teaching, quality of instruction, ability to understand and class size, leading to an accurate belief that school hours is too simplistic of an indicator, and the development of other more specific metrics such as Academic Learning Time(which in itself comprises of different components), engagement(for learning of new concepts) and time-on-task(for repetition and practice) (Berliner, 1990). An interesting tangent here is that the accountability of principals also plays a part in this – Schools where principals are evaluated based on their students' results experience greater benefits of increased school hours (Lavy, 2010). In addition to that, increasing school hours also benefits both developed (Lavy, 2010) and developing countries (Llach, Adrogue, & Gigaglia, 2009), though that also depends very much on the strength of the teachers within the education system.

Homework is another variation on the same concept – While the emphasis is on spending more time on school-related or academic work, homework, as the name suggests, is unsupervised academic work done outside of school, with the student having the autonomy of time management. Homework is thus defined as academic tasks assigned by the teacher to be completed outside of classroom time (Cooper, Steenbergen-Hu, & Dent, 475-495). Two commonly discussed purposes of homework are to practice previously discussed concepts or to prepare for upcoming class material (Epstein & Van Voorhis, 2001), which are important but do not intuitively require educator supervision. In nearly all circumstances, homework completion has a positive relation with student achievement, and the effect is greater at the secondary school level (Maltese, Tai, & Fan, 2012), though the amount of homework completed and perceived time management on homework completion both decrease with increased schooling (Núñez, o.a., 2013). However, it should also be noted that time spent on homework, by itself, is rather rudimentary as an indicator – Students in the same class with different levels of academic ability would clearly spend different amounts of time on homework. Also, drawing relationships between time spent on homework and academic achievement could also be overly simplistic – Aside from the ability of the student, the type of homework matters as well – While application questions are the most correlated with academic achievement, problem sets and "routine" questions are those most commonly assigned as homework. (Zhu & Leung, 2012). However, type of homework is not paid very much attention (Hallam, 2004), possibly because of its difficulty of measurement, leading simpler measures such as time spent on homework to be more favourable for discussion in the public sphere. It is also worthy to note that while type and difficulty of homework are worthy of note, they are also reflections of the assigning teacher's ability to understand the syllabus, the desired effects of the assignments, the ability levels of their students with respect to the difficulty of the assignments and sometimes the individual teacher's ability to compose questions.

While both Finland and Singapore have about 5 school hours a day (Singapore's school day gets longer the older the student), Students in Finland get a 75-minute recess every day (Dalporto, 2015), while students in Singapore get a 20-40 minute recess a day, depending on whether the school follows the ministry's guidelines (Tay, 2011). However, when homework is taken into account, there is a huge disparity between these two countries – Fifteen-year-olds in Finland spend 2.8 hours a week on homework, while their Singaporean counterparts

spend 9.4 (OECD, Does Homework Perpetuate Inequities in Education?, 2014), with an average of 5.9. However, it is also to worthy to note that Singaporean students exhibit a much stronger correlation between the amounts of time spent on homework and test scores.

In addition to that, there is also a common tendency among Singaporean parents, along with many of their regional counterparts, to send their children for private tuition. 67% of Singaporean parents have children who are or have been enrolled in private tuition programmes, with a further 23 percent expression the intention to do so sometime in the future. In addition to that, 23% of Singaporean parents also believe that tuition should start when a child is 3 to 6 years old, and 51% of parents who send their child for tuition spend over $500 per child per month on tuition (Blackbox Research Pte Ltd, 2012), which is over 10% of average GDP on non-compulsory education. This, along with a growing trend of children attending 2 schools at kindergarten age points toward early systematic pressure on children to succeed academically from an early age. On the other hand, Finland does not have a private tuition industry.

From here, what we can tell is that despite similar school hours, young students in Singapore are much more likely to spend non-school hours also focusing on academic activities than their Finnish equivalents, and that the disparity is rather large. Despite the large disparity in academic focus, however, Singapore's advantage in success over Finland, while not negligible, is still relatively small when one considers the amount of extra work put in by Singaporean students. It is also perhaps inconclusive to call Finland an outlier even though Japanese, South Korean and Chinese students are generally recipients of large amounts of homework – The other country on the top of the homework list is Russia, which is not experiencing nearly the same amount of success. This also means that the quality, and not just the quantity of homework matters in the bigger picture.

5.6 Philosophy

When we assume that, for the most part, the overarching philosophy of a nation also comes into relevance when analysing how its education system operates, we can start to see how education becomes a manifestation of political ideology. While the notion that both

Singapore and Finland are doing well for themselves academically, they have done so through rather contrasting means. While students from Singapore have the second highest mean scores, they have done so with an equity in education opportunities barely above the OECD average (OECD, PISA 2012 Technical Report, 2014). Finland, on the other hand, has done the opposite – High equity in education opportunity, but a mean score that is above average. This is a result of the chasm in stratification levels between the two education systems, which are in turn drawn from an overarching agenda politically. In his speech to all principals in 1966, just after the independence of Singapore, the late Mr Lee Kuan Yew, then Prime Minister of Singapore outlined very clearly his goal for society. In his words, "I would like….. To rear a generation that has all the qualities needed to lead and give the people the inspiration, the drive to make it succeed. This would be your elite." He proceeds to go on to talk about having a "middle strata" level of executives, and finally "average" people, though he does acknowledge the fact that even the bottom layer needs the right care to build "a sense of discipline: in himself, and social discipline". In short, Singapore's initial philosophy in 1966 was to build a highly stratified society, but with common values (Lee, 1966). With a changing economic landscape that shifts toward a knowledge-based economy, rapid population growth in the 80s and immigrant influx since the early 2000s, this has changed – Degree holders are at an all-time high and continuing to increase. However, in terms of basic education, not much has changed. Despite slight reforms in the structure of the education system, with more programs, more tiers and hence, more customization to the student, basic education still remains highly stratified, and in fact, more divisions could potentially mean even more stratification.

On the other hand, Finland seems to have a completely different take on its education system, instead choosing to develop diversified student potential. Aside from a basic learning curriculum, Finnish schools also have a high proportion of hands-on classes starting from a young age, such as home economics and art. According to Finland's Chief of Education, Krista Kiuru, "We created a school system based on equality to make sure we can develop *everyone's* potential….. We have small class sizes and everyone is put in the same class, but we support struggling students more than others, because those individuals need more help…..Yes, we definitely believe that for young people handcrafts, cooking, creative pursuits, and sports, are all important. We believe these help young people benefit more from the skills they're learning in school… Academics isn't all kids need. Kids need so much more.

School should be where we teach the meaning of life; where kids learn they are needed; where they can learn community skills. We like to think that school is also important for developing a good self-image, a strong sensitivity to other people's feelings … and understanding it matters to take care of others. We definitely want to incorporate all those things in education." As mentioned before, Finland's high equity in education opportunities seems to share a very strong link with a reallocation in teaching resources toward weaker students, as well as a diverse curriculum to encourage skill development and personal growth (Kiuru, 2014). It is important here to note that while both Singapore and Finland want to promote "community values", Singapore's version of the phrase means contributing to nation growth, while Finland's interpretation of the term refers more to sociability.

In summary, Singapore and Finland have inverse approaches to their ideas of education systems – While Singapore takes a top-down approach and societal needs into account when planning the segmentation of its population, which then stretches out into the education system, Finland considers the needs of the child first, and then plans out its education system to suit the needs of each child as well as possible.

5.7 Summary

In short, we can see that the infrastructure that Finland and Singapore provides to its teachers is very different, and thus the impact on infrastructure on test scores, while important for some countries, is not the distinguishing factor behind high factors, indicating that the "pressure cooker" system of many Asian countries may not be the only way to produce bright children. Additionally, many of these countries are accused of "teaching to the test" and not actually helping their children become well-adjusted citizens. What we can see is that different means of educating students from a young age can also produce good results, even if Finland seems to be an outlier in that respect. While social and interactive skills are important, I will choose not to focus on this because social skills are embedded in culture, and trying to adopt a marker for social skills will invariably not be an objective measure. However, the idea that it is possible to train academically competent children without giving up social capital on a national scale is very interesting from a policy perspective, even if the term "social capital" remains one that has many definitions.

6. Non-education factors

In this section, I will compare Singapore and Finland in terms of the rates of occurrence of potential crises or social conditions that could impact a child's ability to study either positively or negatively. Where similarities occur, I may also use other countries that share these similarities in gauging whether these factors may be important in affecting academic performance.

6.1 Civil Unrest

It should go without saying that having civil unrest in a country greatly affects its ability to operate in many capacities, one of which is opening and operating schools. Fortunately, neither Singapore nor Finland have been in armed conflict since World War 2, so there is no comparison here. Even if I did want to compare these countries to a war-torn one, there is no information on the education systems on these countries. However, this isn't to say war doesn't affect these countries. One of the things that can affect academic performance is immigration rates, of which refugees and asylum-seekers fall under. Another factor worth considering is crime rates, as the lack of safety would detract from the motivation to study, both for parents and children. Fortunately, both Finland and Singapore have fairly low crime rates, and those that are dominant are not violent crimes – Mostly parking violations, drunk driving, and for Singapore, illegal moneylending and e-commerce scams. Both countries also have a high safety index, which describes the perceived level of safety in these countries (Numbeo, 2015), as well as low rates of child abuse. While both countries are safe, and we can and should regard this as an essential condition to the healthy growth of children and their educational development, it would not be the ultimate condition to helping academic achievement.

6.2 Immigration

There are many reasons for people to migrate, such as work or asylum. Regardless of that, there is extensive literature that shows that immigrant students on average tend to perform poorly compared to their local peers. In this section, we then have two bases of comparison between Finland and Singapore; Firstly, the proportion and nature of immigrant students, and secondly, the gap in performance between immigrant and local students. Despite a significant

amount of literature concerning the issue, there are many conflicting results regarding the performance of immigrant students. While it is commonly agreed that immigrant students are isolated from their peers, there are also conflicting views of whether this segregation is good or bad for academic performance. On one hand, the main drawback of isolation is the lack of linguistic development and also that socioeconomic status is one of the main reasons immigrant children fall behind in studies (Ammermüller, 2007), which would point to a completely different problem that exists outside of just being a migrant, though it is possible that being a migrant would amplify the issue. Employment prospects are usually also usually higher for citizens and naturalized immigrants than they are or fresh immigrants, due to legality, administrative and linguistic concerns, which highlights the key struggles that first-generation immigrants face (Fibbi, Lerch, & Wanner, 2007). In countries with high stratification, this problem is exacerbated as immigrant children then have a higher probability of attending a lower-rated secondary school. This is also why immigrant integration is important from an education perspective – Without a system of integration, increased immigration leads to higher entry to worse schools and greater social and economic stratification, which then causes problems for governments from a social welfare perspective.

On the other side of the argument, the lack of interaction with native peers actually is juxtaposed with increased familial support, and that any disadvantages migrant children experience due to lack of proficiency in the native language could be mitigated by higher parental support and strong family ties (Le, 2009). This is also helped by the fact that immigrant children tend to be in networks that more strongly support academic achievement, either as parents push their children to take advantage of new education opportunities as a means of social mobility, or receiving assistance and support from their ethnic peers (Fuligani, 1997). There is also a differentiation between different types of immigrants. Children of first-generation immigrants tend to exhibit higher test scores than non-immigrants, while children of second-generation immigrants showed no significant difference. This would then be an extension of assimilation, but in terms of test scores instead of social, economic or cultural capital. We do, however now reach an uncomfortable dilemma – while immigrant students tend to have better results at school, they also have lower employment prospects.

Comparing the immigration rates of Singapore and Finland produces some very polarizing results. In Finland, foreign nationals number 195 511, or 3.6% of the population (Ministry of

the Interior, 2012). In Singapore, however, foreign nationals are at 1 494 200, or 28.8% of the population (National Population and Talent Division, 2013). This does not include the 540 000 PRs (Permanent Residents), who are given residency in Singapore under certain special conditions, such as sharing family ties with a citizen, holding an employment pass for an extended amount of time, or investing large amounts of capital in a Singaporean firm (ICA, 2014). It is, however, fairly unclear how many of these immigrants are students. While 6% of foreign citizens in Singapore are students (which also means about 1.7% of total population), it is unclear how many of them are undergoing basic education, though if I were to hazard a guess I would say it is on the low side (10% or less). The figures are similarly unclear pertaining basic education in Finland.

On academic achievement, in Singapore first and second-generation immigrants actually outperformed citizens in all areas of the PISA in 2012, even despite the latter group performing well (Akter, 2014). Also, the advantage of the first-generation immigrants over citizens was double that of the second-generation immigrants', indicating a significant difference between these three groups. However, the disparity in the sample sizes leaves something to be desired: While 3331 citizens were sampled, only 307 second-generation immigrants and 663 first-generation immigrants were sampled. While these numbers are statistically significant in a vacuum, this does raise problems of two natures: From a statistician's perspective, homogeneity of variance could be affected. There is also the issue of selection, which I will touch on later on as it makes sense to compare it to Finland's situation. While this information on PISA test scores was not available for Finland, there are other measures that can be used. Students who are Finnish citizens tend to outperform their peers by about a third of a grade, which can range from four to ten, which is about 4% if we assume uniformity in grading and an absence in grade moderation. In addition to that, non-Finnish citizens are an estimated 6.3% less likely to continue with education after compulsory basic school, and even those that do are more likely to choose vocational rather than general schooling, which is perhaps a sign of a lack of ambition as most university entrants come from general upper secondary schools. This, then, is a reversal of Singapore's situation.

In summary, while the proportion of immigrant students could be an explaining factor behind academic results, Singapore and Finland both show a very low presence of immigrant students, even though the performance of immigrant students in each country relative to

citizens are somewhat different and based on the type of immigrant as well. So, immigration is not a satisfactory explanation as to why students in these countries are doing so well.

6.3 Economic Performance

The unfortunate truth of the public education system (or any public system) is that it runs on public funds. Intuitively, what kind of resources schools get to work with is a function of two broad items – Firstly, the economic performance of the country, and secondly, the position of basic education on the pecking order of government spending. With more resources in the education sector, many things can be done. Better classroom facilities can be built or purchased, extra learning resources can be acquired, teachers can be paid more (with the hope of increasing performance levels), more can be spent on teacher training, more after-school programs can be initiated, and the list goes on. In this section, I will examine different indicators of government spending on education to get a fuller idea of how much resources are being sunk into the education system.

Measure	Singapore	Finland
GDP (Millions of USD)	297,941	267,329
GDP per capita (USD)	55,182	47,219
Expenditure per Student, Primary (% of GDP per capita)	11.2	21.1
Expenditure per Student, Secondary (% of GDP per capita)	17.0	36.5
Public Expenditure on Education, Total (% of GDP)	3.1	6.8
Public Expenditure on Education, % of Total Government Expenditure	20.5	12.2
Gini Coefficient	46.3	26.8
Average Wage (USD)	2616	2925

(World Bank, 2014) , (CIA, 2014)

Table 1: Economic Performance of Singapore and Finland

From these indicators, there are a few things that we can see. Firstly, when we look at the big picture, the economies of both countries are doing relatively well, with Singapore having a higher GDP per capita but also a higher Gini coefficient and a lower monthly wage, indicating higher income inequality. It may be easy here to make the hypothesis that Singapore's high mean test scores also means that students of high socioeconomic status are scoring better than the poor ones. However, the difference between calculating mean test

scores and calculating mean income differ in one very important way: Unlike test scores, income (or wealth) does not have a maximum value. This means that an extremely wealthy section of the population can affect average income of a nation, even if most of the country is poor. Assuming this is even true for Singapore, the fact that test scores have a high mean, but also have a maximum value means that a significant proportion of the population has to do well to produce a high mean. When it comes to public spending, however, Finland seems to be spending more than Singapore, right until we get to "Public Expenditure on Education", where Singapore spends a full 8.3% more than Finland does. This is, however, also slightly faulty: This figure unfortunately also covers tertiary and post-secondary education, so I would not lend too much credence to this statistic.

Among the other countries that also demonstrate good economic performance, we can also see that economic performance is not that important of an indicator when we do try to draw a connection toward academic performance. For example, China, which leads in PISA test scores, is 89th on GDP per capita. However, it can also be argued firstly that China's price levels are much lower, and more importantly, that the regions that are high-ranking, Shanghai and Macao, are the only ones that were tested (Hong Kong was tested as well, but whether it is part of China as well is also highly debatable). Also among high-ranking countries in PISA scores are outliers such as Estonia and Vietnam. Oil-rich countries, such as the UAE and Qatar, rank highly in economic terms but poorly in test scores. On the other hand, Sweden, Norway and Denmark, despite enjoying relatively equitable income distribution and economic success, only manages to score middling results in PISA test scores. We can then say that economic performance, while desirable for both education systems and nation building in general, does not guarantee academic excellence.

7. Educator's Systems

Having already expressed that teachers are especially important to the academic achievements of their students, this section will focus mostly on policies regarding teachers that can help them to do a better job. "A better job", however, is a pretty murky concept, though the goals of most nations for their teachers remains broadly the same – essentially, to develop a student's potential, though the question of "in what direction?" can differ from country to country. This section will cover the following factors that are important for getting

good educators into schools. These include financing, professional development, training, appraisal, autonomy and social perception. Many of these things interact with teaching quality in overlapping ways. For example, training does two things: Good training will firstly equip teachers with the proper skills to handle a classroom well. Depending on how the training is conducted, it should also provide teachers with the confidence that they will also need to do well. Job satisfaction is also an issue as well, though there is no one factor that leads to job satisfaction, but rather sources can be split into three broad areas: One based on professionalism, one based on empowerment and one based on rewards (e.g. salary) can conditions (Tan & Stott, 1998). In each sub-section, I will explain why each aspect of education policy is important in terms of affecting teachers' abilities to teach, and then compare Singapore and Finland in that respect. It is also important to note that I am only discussing factors that can be affected by policy, which is why I am leaving abstract concepts such as "building passion" out.

7.1 Financing

By financing here, I am referring to two aspects of financing. Firstly, I am looking at the salary levels of the teachers. While this may make sense when we think of a link between salaries and job performance, this has only been proven marginally true for teachers (Gius, 2014) and that there are other factors that contribute more heavily to job performance, such as class size and job experience (Hanif, Tariq, & Nadeem, 2011). Nonetheless, I still believe this is worth investigating, especially when we think about America's fall in education standings coinciding with its drastic underpayment of teachers, with the average teacher only getting paid 70% of the average college graduate (OECD, Education at a glance, 2014).

In Singapore, Including bonuses, the modal annual salary for teachers aged 25-29 was $43,563 in 2009, and the maximum salary was $77,693. This compares favourably to the OECD averages of $41,701 for a mid-career upper secondary teacher and a $51,317 maximum salary (NCEE, 2010). It also compares well to the average wage levels of the country, indicating that Singaporean teachers are paid well. The other indication here is also that bonuses and promotions are also based on merit, experience and career ladder position, showing that Singapore's rewards its teachers for good performance as well.

In Finland, Teacher salaries are competitive compared to other professions in Finland, being closer to the average wage, but are not discernible from other European countries. Lower secondary school teachers with the minimum amount of required education are paid $34,720 in their first year; at the top of the pay scale, they can expect $45,157 a year. The OECD average for a beginning lower secondary teacher is $30,735 and the average is $48,938 at the top of the scale. These salaries are somewhat lower than other professional salaries in Finland (NCEE, 2010).

Both Singapore and Finland pay their teachers even while they are studying to become teachers, but in different forms – Finland gives all of its university students an allowance (Kela, 2014), while Singapore's Ministry of Education has a bursary program specifically catered to students who are studying to become teachers, which potentially acts as an incentive to attract prospective teachers. While undergoing training, trainee teachers also get a substantial salary that ranges from approximately USD $594 to $2379 (MOE, 2013), based on university grades, junior college grades (if any) and prior work experience or certification. However, Finland's student benefits are usually insufficient, leading to students to work part-time or take out loans. Hence, in terms of money given out to teachers, Singapore spends more than Finland in most stages of a teacher's career. However, it is also worthy to note that living costs in some areas is much higher in Singapore than it is in Finland: For example, total healthcare costs in Finland are paid for mainly by taxation, while 66% of healthcare costs in Singapore are accounted for by private sources, while Singapore's public service and financing coverage is not as wide or extensive as Finland's, so once that is added in it is possible that the difference is not as great as it seems.

Semantics aside, however, what we do see is that teachers in both Singapore and Finland are at least paid at a competitive wage level, both in terms of living costs as well as against other professionals with similar qualifications. This is, however, not to say that paying teachers will make them good – It has already been mentioned earlier that it is not about how much money they are paid, but how it is spent. For example, the country that pays its teachers the best relative to other college graduates is Spain. That being said, teacher salaries are mostly competitive on a within-country basis, and there is no reason to believe that raising salaries

will improve grades drastically, if at all, though there is probably a minimum threshold that involves at least a comfortable income level.

7.2 Recruitment and Training

Aside from a reasonable level of mastery of the relevant subjects being taught (a significant amount beyond the curricular demands), the job responsibilities of a teacher go far beyond that, mostly by virtue of having to interact with dozens, if not hundreds of students at any given time. The load gets heavier when we consider that many teachers spend significant time outside of working hours on job-related activities, such as taking care of after-school clubs. On an intuitive level, compared to the corporate world or a deskbound job, teaching is very different from most other divisions of the public sectors – rather than operation or maintenance, teachers, and to a lesser extent public servants in the education sector are charged with the responsibility of building young minds and preparing them for a future. Skill-wise, teachers require a lot more than just knowledge to teach a class. The fact that, at least in basic education, these young minds are also not legally adults also subjects the industry to even greater scrutiny, especially when it comes to disciplinary matters. In the education sector, we can thus see that mistakes made by teachers have very real consequences, be it about the education sector's public image or having an impact on the futures of their students. Unlike many other careers regardless of sector, a teacher's job is consequentially very unforgiving, even toward newly-minted professionals.

This means two things that are related to this section. Firstly, from a policy perspective, it is then important to make teachers believe that their job involves more than the imparting of knowledge – It also involves heavy administrative duties, academic duties (composing and grading assignments and exams) and arguably the most important but also most ambiguous "character building", which can mean one or more of many things – fostering interest, identifying and building talent, being a mentor, and so on – all while maintaining a good image and managing a classroom, which can be extremely difficult depending on the composition of the individual class. Building such relationships with students are partially indicative of the situation in the classroom and a slight predictive factor in charting student grades (Knoell, 2012). The second thing it means is largely common knowledge – That teaching is not a career suited to everyone. This also means that in the selection of teachers,

and in another way, principals, the recruitment and training process should lean toward individuals who are naturally predisposed, motivated or at least malleable enough for the job. Given previous mentioned literature about teacher quality being important toward academic achievement, I would then be inclined to believe that this could potentially be extremely important. Hence, in this section I will be comparing the hiring and training processes of teachers in Singapore and Finland.

In Singapore, there are a few routes one can take in order to become a teacher, though all the teaching programmes are conducted at the National Institute of Education (NIE). Applicants who already have a degree, which comprise the majority of teaching position applicants, apply for a post-graduate degree in education, which typically lasts a year. Applicants may apply for training programmes directly out of junior college or polytechnics (but only with excellent grades to be considered), in which case the pedagogical training is comprised as part of the degree, with the other courses assigned based on which subject the applicant intends to teach, though this only applies to applicants who which to teach in secondary schools or junior colleges. Candidates in longer programs also get to do either an attachment to a local school or an internship in an MOE-related office, which helps because part-time teaching can also help in the acquisition of core competencies related to teaching (Wylie & Cummins, 2013) Higher-performing candidates are also awarded scholarships that provide a larger stipend, research skill development, more advanced courses and access to more materials, such as seminars with academic professionals (NIE, 2014). Primary school teachers typically do not have a specialised degree as they usually teach multiple subjects. On the aspect of customisability, there are also separate programs for teaching disabled children, which covers programs on how to deal with different types of behavioural, psychological, sensory, intellectual and physical disabilities for different age groups (NIE, 2015), and in fact primary school teachers just recently had the option to take an advanced diploma course that promises to equip them with better skills to cater to six-to-eight year olds (Davie, 2014).As mentioned earlier, only students with passing ‘A’ level results or good polytechnic grades are generally considered – This also means that academically, the students who are admitted to NIE are from the top 30% or so of their cohort (MOE, 2013). In summary, then, we come to a few highly desirable conclusions – People who are allowed to be teachers are academically strong, training is highly specialised to career plans both in terms of discipline and

pedagogical training, people are rewarded for high competency at an early stage and education planning is centralised by virtue of only having one such institute in the country.

Being a teacher in Finland also comes with stipulations of its own. The minimum qualification for becoming a comprehensive (1st to 9th grade) school teacher in Finland is a Master's degree in education, along with 60 ECTS credits (about one dedicated year) of basic or intermediate or equivalent studies in a subject that is covered in comprehensive schools and an additional 60 ECTS of teacher's pedagogical studies (Education, 2006). Teachers who wish to teach at the upper secondary level need 120 ECTS credits in a subject covered at the upper secondary level in addition to 60 ECTS credits in other possible teaching subjects, adding up to a five-year course in any case. In addition to that, teaching trainee programmes are oversubscribed by ten times, so applicants are also assessed on their upper secondary school record, extra-curricular activities, and their score on the Matriculation Exam, after which they undergo interviews and "live" trials where they are observed on their performance on teaching-like activities (NCEE, 2010) as part of a three-part round of selection that also includes an exam based on certain textbooks and an interview discussing the candidate's personal motivations for teaching (Kasenen, 2003). In addition to that, they also have attachments to "field schools" during their time of study, which also enables them to further hone their teaching skills. Unlike Singapore, however, the stratification levels among selected candidates are lower, without special treatment or scholarship, which is an extension of Finland's educational beliefs, though different programs still undergo slightly different curricula – For example, elementary school teacher education includes a more robust practical and research orientation related to child pedagogy and learning (Malinen, 2012). However, it is similar to Singapore in that everyone who wants to be a teacher has to go through the same centralized program, though there are different scheme for teachers who wish to specialise in crafts, home economics, kindergarten and special education teachers.

Besides the obvious difference in the title of the required degree (Bachelor's vs Master's), Singapore and Finland take very similar approaches in their talent acquisition process. Firstly, teachers are centrally hired and trained, giving the state absolute control over the decision to hire any given talent. Secondly, trainees not only need to have extensive knowledge in any subjects they want to teach, but also undergo thorough pedagogical training. In this case,

although the system could be criticised for being inflexible, by having candidates choose their specialty earlier, it becomes easier to plan courses and impart deeper specialised knowledge, aside from also enabling future manpower planning ahead of time. Thirdly, teachers also get "live" experience during their training period, enabling them to contextualize the knowledge that they learn and also preparing them for classroom conditions ahead of time. In conclusion, while being good for the teachers, both Singapore and Finland's training and recruitment policies have also opened up benefits at management levels as well.

While this is not an issue that can be solved solely via policy means, and would take several years to change, for Singapore and Finland to be able to select their teachers from the top performers in their academic cohort, it is also important that people want to be teachers. Aside from job security and pay, one of the key factors influencing individuals self-selecting into careers is the social perception of the career. Part of this is the acknowledgement that education is a crucial component of society and a willingness to be part of the process. Another part of it is the reputation of being a teacher. In Finland, people were rated as having higher levels of faith in the education that any other country and high levels of trust in their teachers to provide a good education. Singapore is 3rd in the level of faith in the education system and also records higher than average levels of trust in teachers to deliver a good education system (Dolton & Marcenaro-Gutierres, 2013). While we do see a correlation here, further analysis shows that status, while important, is not essential to churning out good test scores: Among other high performers, China and South Korea also show very high levels of teachers' statuses, while Japan does not show high levels of trust in their education system or teachers. Meanwhile, among countries with high levels of trust in the education system and its teachers, Greece and Turkey are below average in PISA rankings (OECD, PISA 2012 Technical Report, 2014). Despite that, there is some amount of correlation between the status teachers enjoy and a nation's ability to achieve academic excellence.

7.3 Talent Retention

While teacher quality is not synonymous with teacher experience, it would not be a stretch to believe that the two share a fairly strong correlation. As with any job or task, there are certainly some aspects that can only be learnt or improved on with experience. For example, more experienced teachers are better at managing larger classes, experience less stress from

teaching workloads, and are more confident than their younger peers (Klassen & Chiu, 2010). When considering the school as a workplace and no reason to expect atypical workplace dynamics, having diversity in terms of age helps when the older employees can provide mentoring and coaching (Causon, 2008). Teachers especially have found a mentoring process helpful, or at least perceived to be (Pogrund & Cowan, 2013). Aside from being helpful to new teachers, the chance to observe fellow professionals on the job can also be helpful to the mentors in a different way from classroom practice (Clark & Byrnes, 2012). Thus, it helps to have experienced teachers, which by extension means that part of policy planning for education should be having schemes to incentivise teachers to stay in the industry, if not the job, that extends beyond pay scales and benefits. In fact, for a job like teaching, non-pay factors play a large part in getting people to stay in the industry (Perrachione, Rosser, & Petersen, 2008). Part of career satisfaction is progression, that is, a development of a professional career. This can mean taking on more responsibilities, moving on to a management position, or moving to another sector of the education industry altogether where pervious teaching experience becomes useful.

Despite having one of the younger and less experienced teaching workforces around (TALIS, 2013), Singapore has plenty in the way of professional development. Starting out as a classroom teacher for a minimum of three years, MOE provides teachers in Singapore with the options in three different career tracks. Firstly, the teaching track caters to the majority of educators who wish to make classroom teaching excellence their primary career goal. Pay-wise, a senior teacher or a master teacher are paid roughly equivalent to vice-principals or even principals in some cases (Olson, 2007), indicating a career ladder that incentivises teachers to advance as far as possible. Senior Teachers mentor younger teachers, sharing experience and teaching knowledge with them alongside their teaching duties, though schools have the authority to cut back on their teaching hours to allow more time for these activities. There is typically 1 senior teacher for every 5 classroom teachers. Master Teachers, on the other hand, work beyond the school at the cluster (equivalent of municipality) level to raise the level of teaching practices in schools (MOE, 2001), while Lead teachers typically sit between the two. On the Leadership track, teachers that demonstrate good performance and suitable competencies do exactly what the name of track implies it does – take up leadership positions at various levels of the academic hierarchy, ranging from subject teachers to school and ministry levels. Teachers who have specialised content knowledge also have the option to

end up on the specialist track, which focuses on syllabus planning and best teaching practices related to that specific subject (Steiner, 2010). In summary, the career path for teachers in Singapore looks like this, according to the Ministry of Education (2014):

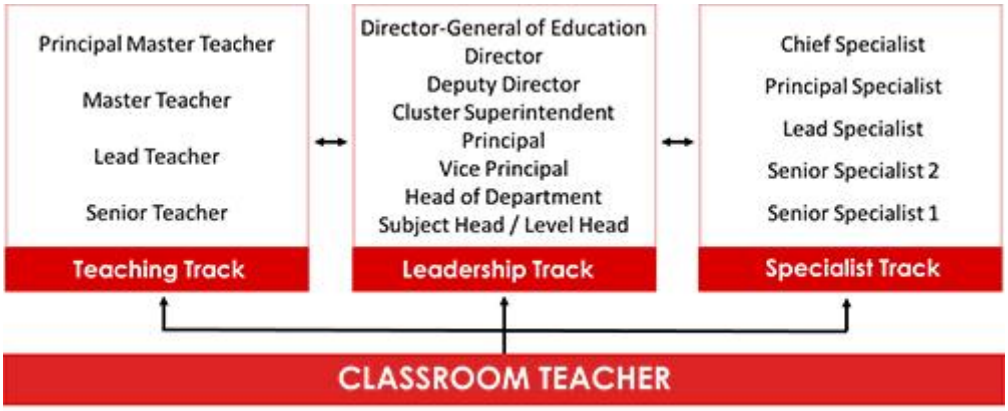

Figure 1. Career Paths of Teachers in Singapore

What we do see here are many milestones on a career track for the average teacher in Singapore. It is possible to argue that many of the positions are functionally similar, or close to each other that they might be redundant – Most prominently "senior specialist" 1 and 2, which are only separated by experience levels. However, from a policy level, this can be seen as a shrewd manipulation of manpower.

Finland, on the other hand, depends on a very different mechanism for teacher retention. Much like the way it treats its students, Finland allows its teachers a large amount of autonomy when it comes to student discipline and curriculum planning, choosing to trust their teachers as respected professionals (Sahlberg, Lessons from Finland, 2011), which can be extremely worrying from a regulation standpoint, though Finland has shown commitment to the cause in its lack of standardised testing anyway. In addition to that, the fact that the selection process is so competitive means that teachers in Finland have a high level of social standing (Sahlberg, The Secret to Finland's Success: Educating Teachers, 2010). Two of the most important factors toward teacher retention are professional freedom and a commitment to children (Webb, Vulliamy, Hämäläinen, Sarja, Kimonen, & Nevalainen, 2004). In this aspect, the autonomy provided to teachers actually sends a message of faith in teachers' abilities, and the interview in the testing phase is supposed to capture the teachers that are committed to educating children. On the topic of mentoring and coaching new teachers, the procedures are mostly left to the school as well where some schools have advanced

procedures and support system for new staff, other schools simply greet new teachers and show them their classrooms (Sahlberg, Lessons from Finland, 2011). Professional development, on the other hand, is not provided centrally, but on a municipality or even school level, and even then, teachers also have the choice as to whether they wish to involve themselves with further education or professional development (Sahlberg, Lessons from Finland, 2011). Even with the presence of optionality, many Finnish teachers still decide to take the opportunity to develop their careers further, either through education-related courses or going for doctoral studies, with the state planning to double its $30 million budget for professional budget for teachers by 2016 (Darling-Hammond & Rothman, 2011). It is also important here to note that Finnish teacher education also draws very much on being research-based (Gustafsson, 2013), meaning a more hands-on approach when compared to Singapore. While the effect of this on teaching effectiveness is questionable, I would then expect Finnish teachers to have a wider pedagogical knowledge base, which goes well with the large amount of autonomy when it comes to lesson planning. On moving away from teaching into leadership positions, there is no evidence of any sort of formalized structure of a career track in that respect. However, most principals in Finnish schools also have an average of 17 years of teaching experience at 11 years of experience as a principal (TALIS, 2013), indicating firstly a selection from the teaching pool, and also a longevity in the career.

Much like the subject topic, both Finland and Singapore seem to have acknowledged the importance of retaining teachers in the industry, regardless of whether it is in a teaching capacity or not, though once again we see that the path by which both countries have achieved this is different as well. While Singapore has made professional development fairly mandatory for career development, it also has implemented several different tracks and many milestones within these tracks. The presence of a large number of milestones would also indicate that the real-time gap in between each stage of the career is fairly short. This would point towards motivation driven by a career ladder in which each rung is "within sight". Of course, a centralised system of professional development would also signal an ideology of having teachers working toward the same goal. On the other hand, Finland keeps teachers in the job by giving teachers increased control over curriculum and assessment matters, with the responsibility making teachers feel more committed and more empowered on the job. Even professional development is largely organised autonomously on the municipality or school level, though the fact that most teachers still participate indicates a willingness to develop as

a professional and commitment to the industry as a whole. The largest difference here is in fact the mentoring system for new teachers – While Singapore is quite adamant about having senior and lead teachers to coach new and less-experienced teachers, the mentoring system in Finland is largely implemented locally as well and teachers have wildly inconsistent experiences. However, this also points firstly toward the robustness of the training program, where teachers can excel under diverse sets of conditions, and secondly toward the same kind of trust that the state puts in the hands of the administrative staff and school leadership.

7.4 Appraisal

From a policy standpoint, teacher appraisal or evaluation, which I will use interchangeably, is essentially the regulation tool of the education system, a form of quality assurance from the education system. Teacher appraisal is an extension of the idea of performance management to the public sector – At its ideological heart lays the neoliberal belief that market principles can provide the structural impetus for enhancing structural accountability, and by extension, performance, to several public sectors (Gaffikin & Perry, 2009). Without strong teachers, education reform cannot possibly succeed – Teachers are, after all, at the forefront of the education system, and they need to be capable and flexible enough to exact any sort of pedagogical shift onto their students (Stronge & Tucker, Handbook on teacher evaluation: Assessing and improving performance., 2003). In the case of education, institutionalized rewards such as bonuses and awards are distributed. By having a good evaluation system in place, it becomes possible to identify teachers that need help, recognize top performers and make learning points from them, measure support all teachers' personal growth in an equitable fashion (Steiner, 2010). While the ultimate goal is to produce good students, evaluation is 'an issue once removed from students ; it is about encouraging the development of teachers that will, hopefully, flow on to better student experiences' (McLellan & Ramsey, 2007). What this firstly means is that the set of standards that teachers are evaluated against should be independent of students – That the ultimate goal is that teachers should be able to work with a wide variety of students. From an administrative level, evaluation also helps when it comes to deciding how to distribute rewards such as promotions or performance bonuses. Career development aside, appraisal is also a useful tool to keep teachers motivated to constantly seek improvement in the quality of their work. In the absence of an appraisal or professional development system, many teachers find themselves improving only up to the

third year of their careers, which seems like a relatively short time to be labelled an "expert teacher" – By the third year, teachers will have learnt enough to get by in the class room but do not have the incentive, but more importantly the support to improve themselves, as a teacher's job responsibilities generally does not change significantly throughout the course of their career (Tucker, 2014). Even if this is true on an individual level, it important for the country for teachers to improve themselves and by extension student experience. To this end, then, appraisal is a tool that helps teachers to learn on the job, and I will be analysing Singapore and Finland this way.

In 2001, the MOE overhauled Singapore's existing evaluation system in favour of a deeper and more comprehensive approach, which it later called the Enhanced Performance Management System (EPMS). Aside from continuing to use elements of the old system, which used observable elements, such as classroom management, subject expertise and instructional skills, the EPMS also looks for unobservable characteristics, or "competencies", that lead to outstanding performance (Steiner, 2010). Competencies, in this situation, and in light of the fact that the EPMS is fairly new, serve two purposes. Firstly, from a research and development purposes, looking for unobservable characteristics can, with enough evidence and time, serve to identify and further develop the concept of competencies, in order to elucidate characteristics that enable teaching excellence more clearly. This way, the EPMS also serves to regulate itself in part. Secondly, and more prominently, the EPMS is also used as a method of helping teachers to identify their own underlying strengths and weaknesses, which firstly allows teachers to adjust their teaching style accordingly either to address their weaknesses or leverage their strengths in teaching, as well as clarifying expectations and behaviours. It also helps both teachers and the MOE identify their ideal career path (MOE, 2006). For example, different competencies have also been grouped into "competency clusters", that is, groups of similar competencies that fulfil the same broad goal of education. This way, both teachers and assessors have a better framework to chart a teacher's progress and find out if the teacher's strengths or weaknesses are related to each other. Finally, although less important in the short term, the EPMS also serves as a calibration tool for learning development initiatives, classroom teaching, ongoing research and upper management to align with each other. The tight coupling (Dimmock & Tan, 2013) would ideally then bring about synergy in alignment, succession and sustainability through consistency between and within generations and through that, overall high performance -

desirable elements for an education system. The aim here then is for teachers to maximise their potential so that their students can as well. Of course, different levels of the hierarchy, even with broadly similar job scopes, also have different competency aims. The following is a table depicting the different responsibilities between classroom and master teachers.

Competency Cluster	Competency	All Teachers	Master Teachers
Nurturing the Whole Child	n/a	• share values with student • take action to develop the student	• act consistently in the student's interest • get others to join the education process • influence policies, programs, and procedures
Cultivating Knowledge	Subject Mastery	• active interest in subject matter • take initiative to keep abreast of education trends in subject	• apply knowledge of trends • get feedback to determine effectiveness • develop innovative approaches • provide thought leadership
	Analytical Thinking	• break down problems • identify cause-and-effect relationships • prioritize tasks according to their importance	• see basic and multiple relationships • analyze and develop solutions to complex, multidimensional problems
	Initiative	• recognize and respond to current situations • act decisively in critical situations • address potential problems before they worsen	• think and act ahead of time to optimize opportunities • identify and prevent potential problems before they happen • anticipate situations to attain long-term benefits
	Teaching Creatively	• use routine methods to teach • provide worksheets and notes • appeal to students' interests by using specific techniques and approaches to teach concepts • assess learning through simple questioning	• use a variety of approaches • use reflective questioning to assist student comprehension • teach a range of concepts simultaneously • exploit learning opportunities inside and outside classroom • inspire learning beyond the curriculum
Winning Hearts and Minds	Understanding Environment	• know policies and procedures • recognize organizational capabilities • understand reasons for people's resistance • understand the rationale behind policies	• apply understanding of school issues • comprehend school climate and apply this knowledge to attain positive outcomes • develop activities that align with school's education vision • apply knowledge of socioeconomic forces • address long-term issues influencing the school's relation to the external world

	Developing Others	• give suggestions to address immediate developmental needs • provide guidance to beginning teachers that draws on personal experience and knowledge	• coach teachers for development • stretch potential of self and colleagues through professional development
Working with Others	Partnering with Parents	• keep parents informed about activities, student progress, and policies • treat parents as partners • encourage parental involvement	• work collaboratively with parents • build and nurture long-term relationships with parents
	Working in Teams	• willingly help others and share information • express positive attitudes and expectations of others • show willingness and keenness to learn from colleagues to attain work targets and goals	• encourage and empower team teachers • build team commitment • highlight and resolve issues that affect teacher effectiveness

(Steiner, 2010)

Figure 2. Responsiblities of Classroom and Master Teachers in Singapore

What we do see here is different levels of responsibilities – While classroom teachers have responsibilities that almost exclusively apply to classroom activities and direct stakeholders (colleagues, students, parents), the description of ideal competencies for master teachers apply more at a macro level, such as building long-term relationships, fostering teamwork and developing innovative approaches. This is despite the fact that master teachers also engage in classroom learning. The other point I wish to draw attention to is that while the descriptions of competencies are detailed, they also describe ideal outcomes, which allows teachers and mentors the freedom to decide how they want to be able to reach that point.

To go into further detail, I will now explain how the EPMS is executed. Teachers begin the school year with a round of self-assessment and goal development in terms of teaching, instructional innovation, professional training and personal development. They report to a reporting officer, who then ensures that the goals outlined for the year are aligned with department, school and national goals and benchmarks. Teachers are evaluated on a yearly basis with a mid-term review, at the end of which they are assigned a grade and ranking within the school. During the process, the reporting officer and the teacher also discuss future career prospects, as well as what kind of professional training the teacher could undergo that would beneficial. Reporting officers are recruited from the ranks of the higher hierarchy of teaching, such as senior teachers, level heads, heads of department and so on, who assist the principal and vice-principal. This is not to say, however, that the EPMS, for all its good intentions, is not without its flaws and criticisms. A ranking system has its merits in

controlling for the subjectivity of reporting officers over an objective grade. It could, however, also be argued that because there is so much at stake on the basis of the evaluation a ranking system also introduces a harmful level of competition between teachers, and could potentially create an unhealthy work environment. Secondly, the process of internal evaluation also potentially removes some amount of objectivity in the process, partly because interpersonal relationships come into play, and partly because schools may have an embedded pedagogical culture that may not mesh well with innovation in teaching, though this would in theory apply primarily to academically successful or disciplinarian schools more. However, having evaluators be in close proximity to teachers in this case could also be beneficial as they could observe competencies over a larger amount of time and are able to observe the people in question more closely than an external examiner. All in all, this seems to be working, as 69% of teachers report that the feedback they received has improved their teaching practices, while 63% report positive effects in their use of student assessments to improve student learning, both of which are above the OECD average (TALIS, 2013).

Finland, while not having a formal teacher evaluation system (Gustafsson, 2013), has its own tact when it comes to assuring the quality of its teachers despite not having a centralised system designed to help its teachers. For teachers in occupation, evaluation, feedback and career advice are largely left to the local authorities to administer (Williams & Engel, 2013). While this has its own advantages where local leaders have higher levels of familiarity with the needs of its students, and given enough time, its teachers as well, the lack of central guidance (which has been reduced to broadly-defined concepts) could also cause uneven standards nationwide. In this respect, then, Singapore and Finland are largely similar in that the final say of evaluation lies in the hands of local leaders – The difference is in the amount of autonomy local authorities have in Finland, which is sizeable compared to Singapore. Instead, Finland has decided to focus the bulk of its appraisal efforts onto the training system for its teachers, in line with its philosophy of trusting teachers – This way, it also empowers potential teachers to be able to work and improve with minimal supervision, leaving development decisions to local authorities (Sahlberg, Lessons from Finland, 2011). The Finnish Higher Education Evaluation Council (FINHEEC) conducts an audit process on higher education schools every sixth year. The focus, however, is on processes instead of outcomes. Every audit has an external review team, though every external review process also includes an internal self-evaluation process, which acts as a SWOT process conducted by

the staff members of the university who present their objectives and present strengths and weaknesses, after which the external review team acts on this information and presents recommendations. Within the teaching profession, feedback can also be given from the schools during annual seminars that are organised by researchers in subject didactics and involving people in the teaching profession, where everyone can share their findings and best practices. (Niemi & Lavonen, 2012), so the educators do provide useful feedback to the training system as well. In addition to that, and perhaps quite importantly, Finland's teacher education system shares a tight connection to research (Malinen, 2012). While not having any direct connection to any observable teaching metric initially, this does help Finnish teachers when it comes to dealing with problematic situations in the classroom on their own, which is one of the ideal characteristics of autonomy, despite going against the European trend of state assistance in basically every imaginable aspect. While this might seem very threadbare compared to Singapore's system, it is important for us to know that Finland uses its evaluation solely as a developmental tool instead of a controlling tool (Virkunnen, 2011), which also explains the lack of grading and performance incentives. Furthermore, by removing strict teacher grading, it removes the pressure to perform as well as the element of competition between peers with the ideal of creating a more collaborative teaching environment. With this approach, the reception to feedback has not been doing so well - 38% of teachers report that the feedback they received has improved their teaching practices, while 32% report positive effects in their use of student assessments to improve student learning, both of which are far below the OECD average.

In conclusion, while appraisal does seem to be an important aspect of improving teachers, Singapore and Finland take different approaches to the matter and have slightly different aims. While Singapore overhauled its evaluation framework in 2001 to focus not just on observable characteristics but underlying behaviours or even patterns of thought that make a teacher good, Finland has chosen to leave in-job evaluation up to the local school authorities (usually the principal) and instead focuses central efforts on constant evaluation of the program that is churning out these teachers. With regard to the teachers directly, appraisal served as a platform for accountability, distinguishability and improvement while Finland focuses almost exclusively on the latter. If we look at on-job evaluation in isolation, then it is clear that Singapore is doing a much better job than Finland at it. However, the fact that Finland's teachers are not benefitting nearly as much from evaluation, but still producing

students with good academic results should introduce the possibility of Finnish teachers already being at a high level of teaching ability as a result of a constantly evolving teaching system. This is not to introduce anything causal, however; another likely possibility is that the local authorities who are in charge of evaluating teachers may not be as experienced, nuanced or guided as their peers in Singapore.

7.5 Autonomy

Autonomy, in the context of this section, will be defined as the amount of self-control an individual (in this case, a teacher) has over how he or she goes about accomplishing previously set goals. This does not apply as much to outcomes as it does to processes, accountability and day-to-day interaction with students, colleagues and parents. This section will focus on how much autonomy the teachers in Singapore and Finland have on their jobs, though not as deeply as there has already been some overlap with previous sections in the used literature. This is, however, not to say that autonomy for teachers is not important in nurturing good students. Firstly, autonomy is identified as a key psychological need, alongside competence and relatedness (Reeve, 2001), which have been discussed earlier in this paper, and directly related to mental health, which not only should be a prerequisite for being in the education (or any) industry, and directly related to job performance (Brien, Hass, & Savoie, 2012) Across several industries, it has been proven that autonomy is a large part of job satisfaction, which in turn is influential toward performance. (Yean, 2015), and this applies to teacher as well, with high levels of autonomy correlating with lower on-the-job stress and higher levels of empowerment and professionalism, which do correlate with higher levels of job satisfaction (Pearson & Moomaw, 2005). There are many factors that can influence an individual's autonomy, such as environments, relationships and social norms and conditions (Sadeghi, Amani, & Mahmudi, 2013). However, I will be primarily focusing on autonomy from organisational structure, that is, formalised rules, targets and processes, mainly because it is difficult to quantify conditions such as relationships and social conditions, but also because these are not circumstances that are easily affected through policy or legislative measures.

As has already been discussed, Singapore has a highly structured system for teachers to operate in: The curriculum is centrally planned, and with constant coaching and an evaluation

system that lists ideal types and the competency criteria for career progression, the expectations of what a "good" teacher should be is communicated to teachers quite clearly. This should point toward an extremely rigid system fairly resembling new public management where there is an idealized end product for every system, and processes are streamlined and optimized to that end, and there is indeed a vision for what an ideal teacher is. However, that is a skewed vision, and a deeper look into the evaluation systems show that the idealized outcomes for teachers are defined, but not extremely so, which leaves a good amount of flexibility in terms of how competencies are demonstrated and the process of reaching those competencies. Even if that were not true, and teachers were feeling stress, it may not be such a bad thing; the best-performing education systems are those where the educators juxtapose high levels of satisfaction and stress (Shin & Jung, 2013). Compared to Finland, teachers in Singapore are under more scrutiny from their principals, who record much higher levels of involvement in ensuring that the teachers work in accordance to school educational goals, observing classroom practices of teachers, managing teachers' professional development, taking exam results in considering to designing curriculum, taking over lessons for absent teachers ensuring clarity in the curriculum and helping teachers with their classroom problems (Soh K. , 2014). Some of those items may seem heavy-handed, though it does go in line with Singapore's general philosophy regarding the issue, but other items can also be viewed as assistance. Furthermore, the MOE has started to shift away from such a heavy-handed approach by forming Professional Learning Committees (PLCs). Broadly, PLCs help to create a professional learning community, focus on learning rather than teaching, work collaboratively and hold individual teachers accountable for their own results (DuFour, 2004). In Singapore, this is also done with the aim of increasing teacher competency and capacity (Salleh, 2013) by allowing teachers to form a pedagogical framework to assess teaching ideas, both of others and their own, which would allow them more professional autonomy and increased competency, though it is important to note that the focus is still on helping students achieve good results. The emphasis is on raising competency before granting autonomy. However, this initiative is still in its early stages, with little in terms of tangible results, though the outlook is positive (Soh K. C., 2011). By doing this, it is possible that Singapore is starting to move to another stage in the evolution of education system, which is a good sign of a growing system (Mourshed, Chijioke, & Barber, 2010).

In summary, the levels of autonomy that teachers experience, while not draconian in either country, also shows a large disparity between Singapore and Finland. Which is "better", is then a question of perspective. Clearly, Finland's laisse faire policy in allowing teachers close to full control of their classroom duties is better for the teachers when organisational welfare factors such as job satisfaction and empowerment are concerned. Singapore's policy, on the other hand, shows much higher levels of regulation, which is more desirable from a policy perspective. Interestingly, however, Finland's test scores are more equally distributed than Singapore, which seems counterintuitive given that Singapore's system is designed to provide equal opportunity. This further reinforces the notion that firstly, every child has different academic capabilities, and that the equality in Finnish test results is indicative of a tendency to focus more resources toward the development of weaker students.

This is not, however, to say that either country is more "successful" than the other – After all, both countries are still among the top-ranking education systems in the world. What is interesting, however, is the tension between the previously discussed appraisal and autonomy when it comes to teachers. Theoretically, it would be possible to condense both these items into "independence". Having a comprehensive appraisal system like Singapore's, or any appraisal system at all, means some sort of ideological direction that the system believes teachers should be advancing in. This would also then mean lower levels of autonomy, and Singapore's system is quite thorough in its enforcement of an ideal. The success of Singapore's education system also means that while it has succeeded in training its teachers in a specific rubric of teaching some level of adaptability, it is also a testament of an extremely high standard of educational central planning. While this may seem like a bad thing, guidance and assistance is also provided through this enforcement. The question is whether the value of this guidance yields greater benefits than freedom. Finland's system only has informal channels by which teachers can seek assistance, though the autonomy that teachers enjoy means that they can afford to be more creative with their work, adjust their curriculum specifically to fit their class, and are more empowered on their job. What this does show is that each side of the spectrum of appraisal and autonomy has its strengths and weaknesses. In this case, Singapore and Finland, on opposite sides of the issue, have both achieved success, which means that there is no "right" path to choose. Instead, regardless of the path, the success of an education system is not predicated by the choice between appraisal and autonomy of the teachers, though it can be affected, but rather how the choice is pursued.

Both Singapore and Finland have gone down their respective routes by being consistent in their approach, which are also in line with the general philosophy behind their goals for education. The interesting aspect here, then, is that the respective ministries of education treat their teachers the same way the teachers are expected to treat their students. While Singapore has a very structured framework and ideals for both its teachers and students, the Finnish system is designed to equip both teachers and students with cognitive and/or pedagogical tools, leaving the rest in the hands of the agent in question.

8. Discussion and Analysis

In my analysis of the education systems of Singapore and Finland, I have investigated different aspects of each education system to distil as many differences between them as possible, with the residual factors being crucial to educational achievement. This is not to say that achieving education success from a policy perspective is easy – Aside from planning and education, there are also several macro factors that exist across many branches of government that are crucial. Importantly, however, many of these macro factors bring benefits that are likely more important, with a climate suitable for schools to exist and thrive a by-product more than anything else. In this section, then, I will explain these factors, in order of scale – Firstly the broadest policy measures and conditions that need to happen and ending with the aspects that are largely controlled internally by branches of the department of education or even by individual agents themselves. The eventual model will look like a pyramid structure – The bases are the most important areas, and moving up the pyramid we get a more complete picture when it comes to the smaller details of education. They affect educational achievement in different ways, so the idea is that many of the factors closer to the base, when taken away, while policy measures intended to supplement ideas higher up the model will either be rendered ineffective or impossible to even begin to implement.

The first common denominator between Singapore and Finland is having a suitable environment for schools to exist, and for students to develop. What this means is public safety and a moderate level of financial security. This allows children the space to grow as people and focus on learning, and also for teachers to feel safe at their jobs, which is part of keeping them in the industry. Furthermore, many educational policies cost a significant amount of money on account of training, financing and administration costs, and without

some level of economic stability, implementing these policies becomes unfeasible. To that end, then, the fact that neither nation reports low, if any, levels of corruption is also extremely important.

On the next level of the model are the goals of education – More accurately, how they are defined. This is important because the philosophical ideal of the nation will shape the policies that will come, and without a clear idea of the ultimate goal of education, the planning and execution stages of basic education will not mesh, which is ultimately not good for students. What this means is that for someone coming up with education policy, outside of making sure that all the agents in your system have basic amenities such as food, water, housing, financial security and physical safety, having a clear direction to plan the policies towards is integral toward the construction of a good education system. Of course, this will be irrelevant if there are no conducive conditions for students and staff alike to develop, as regardless of how strong the goals of education are, it will not matter if the state has no resources or stability to build a grounded education system. From there, it becomes possible to progress to the next stage of education policy formation.

The next common point between Singapore and Finland, although not discussed explicitly in this paper, is the "structural integrity" of the education system. Although Singapore and Finland have vastly different positions on the idea of basic education, a large part of the reason both these countries are able to succeed is the internal consistency of their education policies. Singapore believes in a guided approach that requires constant monitoring and tweaking, while Finland's education system is largely based on self-learning and trust in the agents within the system. To that effect, then, the policies of both countries are consistent with their respective philosophies, down to syllabus planning, class size and teacher training. Looking at the education industry as a network consisting of many groups of stakeholders such as teachers, ministries, students and parents, and that the education industry has broadly one aim, that is, to educate pupils, it is then important to have tight policy coupling that encourages these local networks to work toward this goal (Rosche, 2012). In the absence of tight coupling, what happens then is that each local network works to its own advantage, and usually at the expense of the industry. For example, schools cut back on supplies and sometimes the pay of its teachers to improve its balance sheet, which hampers the learning of

students. Teachers, who are unhappy at the lack of resources, are less motivated, or form a union to demand higher pay and better working conditions. In either scenario, the students also suffer from the apathy of the teachers. Finally, it is also important that different departments within the education are able to work together for the improvement of the education system as a whole by establishing definitions, measures, criteria, feedback arrangements, priorities and procedures (Cort, 1970). To this end then, it is important that the education system is free from a diverse set of political agendas which stretch the education system in conflicting directions. Doing this will ensure that different departments are able to work toward the same goal, It will also help to establish workplace stability as a platform for improvement.

The fourth area of comparison that Singapore and Finland have in common is the level of investment it puts into training its teachers. Aside from having a stringent selection process, both countries engage its teachers in rigorous training schemes and help their trainee teachers to develop classroom competencies through work attachments as well. Aside from that, extensive lessons on pedagogy, which are not commonplace around the world, are mandatory for prospective teachers. This means that both countries treat teaching as a serious enough profession to have prospective teachers go through courses that pertain specifically to teaching. Finally, the talent pool from which teachers are drawn is also quite strong, with almost all teachers coming from the top quarter of academic performers in their own cohort. This means that the people who are supposed to guide students to academic excellence have also achieved it themselves. This, however, will be rendered inadequate if the weak social perception of educators pushes top students away from the education industry.

Finally, and this is where the two nations differ, both Singapore and Finland have opted to make trade-offs between appraisal and autonomy with regards to how they want their teachers to treat their students and also their own career development. The similarity is in the explicit decision to have settled on the trade-off and stuck to it despite the potential backlash and political consequences, retaining a high quality of teachers, and the difference is in the choice that each respective nation made. One of the reasons many nations struggle with getting their education policies to work is the political need to satisfy multiple stakeholders – The final effect is the implementation of half-hearted or contradictory policies in an attempt

to maximise both autonomy and appraisal, reaping limited benefits from either and suffering the ill effects of the conflict. The point here is that at the very top of the pyramid, the parts are modular. This, however, will not work if teachers do not have the necessary skills and the right policies are not in place to follow through on the original aim of the education system – To some extent, it does not matter how well-designed the policies are if the teachers are not capable enough to implement them (Stronge, Evaluating teachers and support personnel, 1993). To put things into pictorial form, then, the model would look like this:

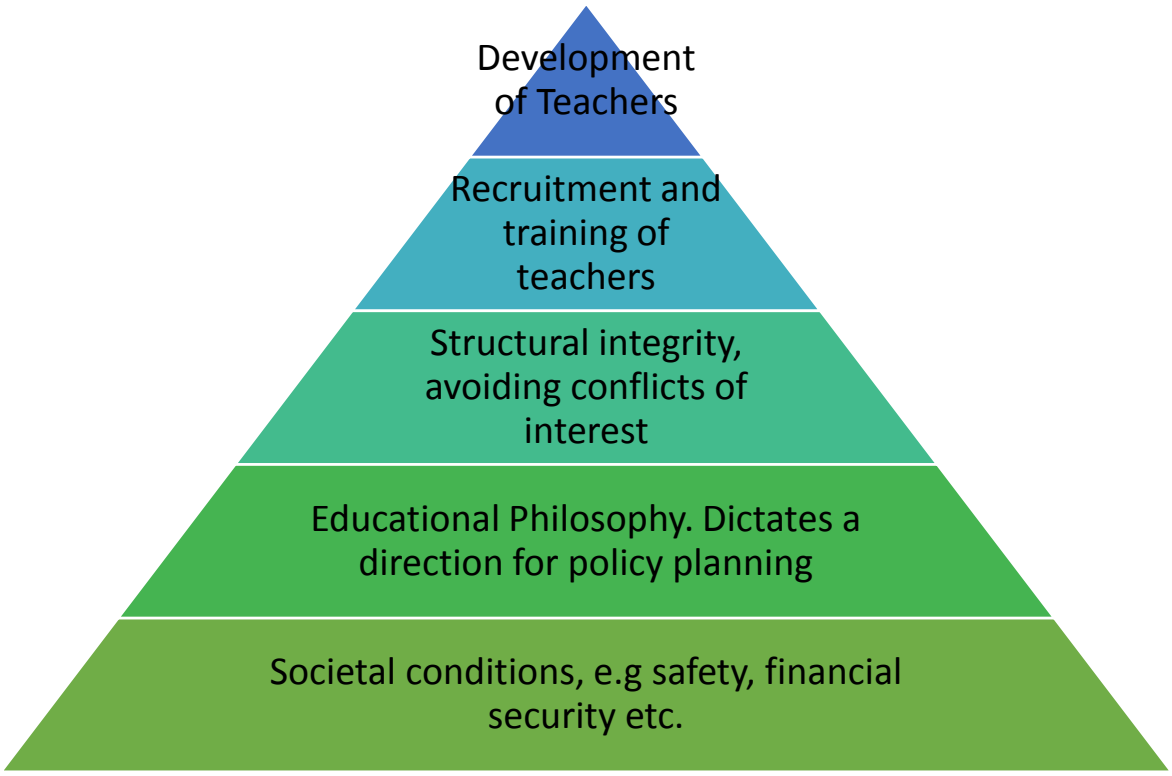

Figure 3. Recommended Model for Building an Education System

This diagram shows the order in which policies should be planned toward: First the bottom layer of the pyramid has to be built before each subsequent layer is built in progression, similar to a pyramid. Hence, society has to be stable first, followed by a solid philosophy, structural integrity in the working hierarchy, good recruitment of teachers, and finally capitalizing on their talent to further develop and retain them. Arguably, having good teachers may be more important, as they are at the frontline implementing any policies or reforms that concern students, so they definitely need to be capable enough to adapt to any adverse conditions and resistance they may face, such as Singaporean teachers being trained to deal with large class sizes. However, without any of the layers below it, it is much more

difficult to attract and develop capable teachers. Of course, all this needs to be executed well to show results, and changes may be made depending on external conditions that may affect implementation, such as a stagnant political climate, strong social stigmas against teaching or a poor perception of the education system. While the model may feel very general, I believe that people can and should adapt this to situation-specific studies, identifying issues that pertain specifically to the country in question when making policy plans and recommendations. It should be noted that this is not in order of importance, but rather an order of priorities – The steps at the top cannot be reached without first establishing the base. This is not just about creating a good education system, but rather, creating an environment suitable for children to learn and grow, and recognising that education is a large part of that.

9. Limitations

While I have presented this model, I will admit that it has some limitations in its conception. In this section, I will discuss some of these issues and how they might supplement this study.

9.1 Longitudinal Information

Firstly, while many of the policies implemented make sense and have resulted in improved academic achievement, the lack of databases that date back to the 60s or 70s, when many of the reforms were first implemented. This is due to education being a relatively new field of study, globalization being a new phenomenon as well as a lack of equipment and infrastructure with which to collect and analyse research data. The presence of this information would allow me the possibility of constructing a timeline detailing trends in test scores over the years combined with the implementation of policies. This would be useful to education analysts who wish to study the impact of policy trends over time, as well as nations who wish to understand how long its policies may take to manifest its effects. One of the common trends in policymaking in the current political climate is a tendency toward quick-fix policies, and knowing how long a policy might take to take effect is important in curbing such tendencies. That being said, due to unique situations that each country faces in its economic, social and cultural climate, this may not be very helpful as none of the studies related to policy implementation may be applicable once these extraneous conditions are taken into account.

9.2 Possible omissions

I have deliberately focused on factors that can be affected through policy measures, as well as measures that directly affect students' lives. What I have not discussed is factors that affect students through two, three or more connections. For example, the training and hiring policy of back-end staff and policy planners is important in ensuring policy continuity and efficiency. A more glaring omission is that of principal management. Principals play an important role in organisational leadership for schools, give teachers guidance and oversee many of the autonomous decisions the school makes. However, I believe that principals have very little bearing on how exactly the teacher goes about planning lessons. Furthermore, even for departments under the broad system of education, the further they are from actual interaction with students, the less their job scope is tailored toward education and more toward general administration, which means there are less pertinent learning points to be had. In addition to that, such a discussion could just go further and further from the topic area at hand and never end. Thus, in the interest of streamlining this research I have decided to keep my topics of discussion as close to students as possible.

9.3 Lack of account of non-policy factors

It is possible to discuss all the extraneous factors that could affect student achievement, such as crime rates, general safety, divorce rates, natural disaster, climate, pollution levels or socioeconomic status. This, while extensive, would be problematic in a few ways. Firstly, as I have mentioned before, many of these factors are not easily affected by policy. This means extensive discussion on the issue would mostly not be useful – It is probably better to acknowledge it and move on. Those such as crime rates, which can possibly be remedied through governmental action, also lie under a completely different branch of government, which should be working to solve the issue at hand anyway. Beyond discussing why this might be important towards providing children with a good environment for learning, I would not be able to offer any policy advice beyond "this should be fixed", and thus I have tried to only discuss those that are the most important. Secondly, different phenomena can have different effects depending on the society they are placed in. The easiest example of this is in divorce rates. On the surface, divorce rates means that the child is growing up in a "broken home", with a lack of adult supervision and a lack of balance between masculine and

feminine forms of parental care. However, the social image of divorce can be very different according to society – While divorce is generally frowned upon in Singapore, it is a fairly normal occurrence in Finnish, and to a larger extent, Nordic or European society, which means that children of divorcees have different social statuses in Singapore and Finnish schools, and also that familial treatment in single-parent households is more well-adjusted in Finland than it is in Singapore. This is not optimal when we are considering criteria that can be applied internationally, ideally regardless of context. Nonetheless, I do feel like my model is quite applicable for the most part, and I cannot think of any situations or conditions that would allow for any of the steps in the model to be bypassed or replaced easily.

9.4 Measure of educational success

The final issue I wish to discuss is the choice of international standardised test scores and a measure of educational success. My justification of using this is essentially the lack of a better alternative. In the past, other measures of gauging the success of an education system were faulty in their own right. For example, tertiary admission rates are greatly skewed by local admissions criteria – Almost all European citizens go to university, while this is not true in Asia. The same goes for standardized testing – localised standard tests differ in difficulty and coverage. As a result, then, I have decided to use international standardised test scores. The inception of the idea, however, is rather knew, and links back to the earlier point about not having information that goes reasonably far back in time. It is entirely possible that this study done a few decades later may yield better results, partially because more information over a longer period of time will be available, and partially because the test itself would have been evaluated and modified, hopefully to better measure student learning and academic capability. In addition to that, information regarding more countries would be available – almost all of the countries surveyed in international tests are developed countries.

9.5 Information Scarcity

Throughout this paper, I have primarily used fairly "convenient" indicators – That is, indicators are easily measurable. However, behind these variables lie processes that are difficult to document and compare across nations. This is either because the processes are too diverse that comparing them becomes problematic, or because much of this information

regarding internal processes and agendas are largely hidden barring government clearance, and understandably so. With more information, I, and many other researchers, would be able to better document the processes of each education system for greater clarity.

10. Conclusion

In conclusion, through the process of this paper I have compared different aspects of Singapore and Finland's education systems with the objective of looking at two vastly different education systems, searching for similarities that help to foster high levels of student achievement, which have been split into three broad areas – Education infrastructure and macro policy issues, societal issues and policies surrounding educators. There was nothing remarkable about education infrastructure in either country – many factors were either present in other countries that were not necessarily doing well or differed between Singapore and Finland. What did matter was that both countries had a strong philosophical stance regarding their prerogatives for education, and that this conviction flowed into their policies that pertained to educators or education system. Singapore's relatively controlled approach goes very far into detail and seeks to maximise the strengths of its educators with several career paths that utilise the different strengths that teachers may have, working towards an ideal type of educators that it wishes to train within a fairly rigid basic education system for students. Finland, on the other hand, leverages a robust training program with a focus on research for its teachers to explore different pedagogical methods and make adjustments for their students as they see fit. What the two systems did have in common was tailoring its policies for teachers according to the overarching philosophy that was present, and pursuing these policies with conviction across many levels. These strengths also then showed up in the results of standardized testing. There are also some societal factors that came into play as well, namely that stability was very important, in terms of financial security, opportunities for schooling and low levels of violence and corruption. Finally, I presented a model detailing policies measures to foster academic performance. While it works as a general framework, it also needs to take extraneous factors into account since every education system is different and has its own challenges in its own way. I do also feel that education is a largely nationalized phenomenon. While it would probably be better if we could all work towards an optimised education system that adapts according to its surroundings, the general international political climate does not allow such free exchanging of information between governments, or between governments and the public. In that respect, then, I believe my

model could be improved on with greater clarity of information regarding processes and more data. It is possible, and I am hopeful that the rise of globalisation may transcend these barriers and allow more parties to work together to determine the direction of future education research and development. I hope that the model I have devised will prove useful for future research pertaining to this subject, and I have made it as general as possible to allow for interested parties to adapt their work to situational contexts.

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