KEMENTERIAN PENDIDIKAN MALAYSIA

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BEST PRACTICES OF EXCELLENT EDUCATION SYSTEMS:

A WAY FORWARD

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Best Practices of excellent education systems:
A way forward

By : Rusmini Ku Ahmad, PhD IPGM

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Edited by : Shamsul Nizam Kachi Mohideen, PhD and Azleena Mohamad, PhD

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* *All figures and diagrams included in this book are taken from OECD (2011) document & Sahlberg (2011,2015)*

ACKNOWLEDGMENT

I wrote this book after reading The Organization for Economic Cooperation and *Development (OECD)* Report on the best practices of excellent education systems around the world. I felt obliged to share with Malaysian readers some of the best practices from all around the world for Malaysia to emulate. These best practices of the selected countries can be concluded as 'game changer' for our Malaysian educational context. I believed that best practices should be shared and implemented in our own context using our own way. For that reason, I would like to extend my gratitude to all the people who has given me a strong support to make this book a reality. First and foremost, to the Rector of IPGM and the Deputy Rector, thank you so much for giving the idea to pursue this academic contribution in the name of education. To the editors, thanks a million for your efforts in editing the manuscript. To the readers, thank you so much for choosing this book as your reference. A reading is great but implementing what is suitable for our education system is even greater. To my family, whom always being acknowledged at the last part, but in my life you are always first. Thank you so much for being very supportive and be the wonderful gems of my life.

Rusmini Ku Ahmad, PhD

FOREWORD

Malaysia is in the effort of delivering quality education to enhance students' performance and nurture the learning culture among the students. This effort is translated in the Malaysian Education Blueprint (2013-2025) which aims to achieve two main aspirations namely system and students' aspirations. Numerous underlying initiatives are outlined to achieve these aspirations and the journey towards improving the PISA results and to stand tall with other excellent education systems. As part of this process, the Institute of Teacher Education Malaysia (IPGM) is undergoing rapid transformation processes through series of initiatives. Among them are to upgrade lecturers' profile, to inculcate research culture and to choose the best to join the teaching profession via talent review and high qualifications.

This book is written for the context of Malaysia and those who are involved with education, from policy makers in the Ministry of Education Malaysia to those at the grass root level who are the teachers and educationists within the educational setting of Malaysia. This book has made close reference to the document produced by OECD (2011) entitled Lessons from PISA for the United States, Strong Performers and Successful Reformers in Education as a benchmark for the seven outstanding strong performers and high achievers of PISA. While the OECD Programme for International Student Assessment (PISA) provides the world's most extensive and rigorous set of international surveys of the knowledge and skills of secondary school students, the countries that performed well are mostly from Asia. Singapore, China, Japan and Korea are constantly at the forefront while countries such as Finland, Canada and Germany consistently outperform other developed nations.

So what are the lessons learnt from these countries that enable them to achieve or sustain high performance in PISA? It is the intention of this book to showcase the success stories of excellent education systems that can be emulated by Malaysia based on the following contributing factors:

- political will, policies and strategic planning of the nation
- selection and recruitment of quality teachers
- effective pedagogical approach and innovative teaching methods
- comprehensive and dynamic curriculum

These factors are reviewed in Chapter Nine and suggestions for moving forward are discussed with close reference to the excellent education systems of seven successful performers of PISA. This allows us to compare and share some of the outstanding best practices of teaching and how schools and teachers could deliver high quality outcomes as part of the overall educational transformation agenda.

Shamsul Nizam Kachi Mohideen, Phd
Azleena Mohamad, Phd

• INTRODUCTION •

Introduction

Why change?

Education is fundamental. It is a slate where areas like economic, social and political will benefit from its triumph. The search for development and improvement in education has never stopped since human civilization. From learning the basic 3Rs (reading, writing and arithmetic) to enhancing personal development with technology-powered knowledge and productivity tools, the struggle keeps on escalating to hold education as a prime agenda for almost every country in the world. Globalization and technological advancement have characterized and impacted the way people do business, connect and socialize with each other, share and disseminate information thus promoting a well-informed citizen. Realizing the dynamic global changes, many countries review their education system to meet the new demands and challenges. The United States of America responded to the decline of the international assessment PISA (Programme for International Student Assessment) by launching the most ambitious education reform agendas. Entitled "Race to the Top", the agenda encourages US states to adopt internationally benchmarked standards and assessments as a framework within which they can prepare students for success in college and the workplace; recruit, develop, reward, and retain effective teachers and principals; build data systems that measure student success and inform teachers and principals on how they can improve their practices; and turn around their lowest- performing schools.

Meanwhile, Singapore is embracing "Teach Less Learn More" under the concept of "Thinking School Learning Nation" agenda to sustain their excellence in education at international level. In raising international education standards, Malaysia had launched a comprehensive review of the education system and developed a new National Education Blueprint 2013 - 2025. The goal is to establish a clear vision and aspiration for individual students and the education system as a whole over the next 13 years. Students are aspired to acquire knowledge, thinking skills, leadership skills, bilingual proficiency, ethics and spirituality and national identity. While the education system focuses on access, quality, equity, unity and efficiency.

The greater challenge for the education system around the world today is to prepare the students with the right skills and knowledge that require expert thinking and complex

communication. The didactic teaching, which is more suitable for the Fordism paradigm is giving way to differentiated learning and collaborative teaching. The 21st century needs a highly skilled human resource that can solve problem ingeniously, think creatively and innovate continuously. This also means that there will be a growing income gap between the less educated, relatively unskilled workers and highly educated, highly skilled workers. Routine tasks are increasingly being automated and routine work is moving to countries where the cost of labor is very low. The proliferation of technology innovation has propelled the challenges in this century. Working and living have never been like before. Information can be disseminated within seconds to the masses.

Globalization has made it possible for knowledge workers to work and contribute anywhere and not only confined to their country of origin. Many countries are competing to have the best brains at the good wage in order to stay competitive. Having basic education is believed to be insufficient to strive through the forceful changes in this era. In responding to these developments, government and policy makers must expand the aims of education, not only focusing on acquiring the basic reading and writing skills but also providing education for everyone to become "knowledge workers". Providing quality education for all is thus a noble intention that can prepare future workforce with the required knowledge and skills to face the expectations and realities of the working world.

Measurement of excellence

There are many indicators used to gauge countries with high performing education system. Among those given by the OECD report are; almost all of their students are in high school at the appropriate age, average performance is high and the top quarter are among the best performers in the world (with respect to their mastery of the kinds of complex knowledge and skills needed in advanced economies as well as their ability to apply that knowledge and those skills to problems with which they are not familiar with); student performance is only weakly related to their socio-economic background; and spending per pupil is not at the top of the league tables (OECD, 2011). Most countries use Programme for International Student Assessment (PISA) as an international benchmark on education system. PISA involves extensive and rigorous international surveys to assess the knowledge and skills of 15-year-old students. Every three years, PISA compares outcomes for 15-year- old students on measures of reading literacy, mathematics and

science. The assessment not only measures whether the students have mastered the curriculum or not but on how they apply it in their everyday life and how the students are prepared for the working world. However PISA is unable to identify the cause-and-effect relationships between certain factors and educational outcomes, especially in relation to the classroom and the teaching and learning process that takes place there. The tests also do not provide a comprehensive overview of the successes and failures of any single education system. There are many other factors such as the proportion of young people not in education, employment or training after the age of 16; the proportion of people who hold higher level of qualification; adults rates of employment; measures of economic productivity; that contribute to the success or failure of an education system (David Harbourne, 2013). Measuring of excellence or high performing education system does not depend on a single yardstick. Nevertheless those factors mentioned above are capable of telling or reflecting the right process of educating the students in order to achieve education goals nationally as well as internationally.

Organization of the book

This book attempts to share some best practices among the countries that have consistently shown excellent results in the PISA league and be able to sustain and continue to improve the education system. Examples are taken from seven countries namely Finland, Singapore, Canada, China (Shanghai and Hong Kong), Germany, Japan and Korea. Apart from that, their other successes include achieving universal primary education, providing equal access to education for all, less significant variance among schools, growing number of students pursuing tertiary education, empowering technology to elevate all students' performance especially from remote areas, promoting teacher quality through selecting the top students, sustaining teachers skill by having continuous professional development and many more. In a nutshell, these countries are fully emphasizing on quality, accessibility and equity. The organization in each chapter starts with an overview of the education system. The context of the system reflects the culture of respective countries. Countries like China (Shanghai and Hong Kong), Singapore and Korea stress much on examination. China has a long history in putting much emphasis on examination dated from 603 AD as an invaluable tool for the public to become government officials, to be appointed as ministers, to be married to princesses and the opportunity to enjoy glorious home-coming ceremonies. Japan puts priority on group performance. The culture of collegiality in their society is mirrored in the teaching and learning process where good students will help the weaker ones so as to uplift their

achievements together. Meanwhile Germany has a strong system of apprenticeships that trains many school-leavers for jobs. Their education system streams students as early as age 10 into a tripartite system, Volkschule/Hauptschule, Reaschule and Gymnasium which focuses on academic and vocational competencies. Finland and Canada respectively hold fast to equal access in education. Almost all schools in Finland demonstrate the same quality of achievements. All students including special needs kids are placed in the mainstream classroom and study the same curriculum. In Canada, immigrants students are given special attention and provided with extra class especially second language like English and French so that they do not lag behind during the learning process.

The next section will discuss on the outcome of the education system specifically in the country's achievement and progress in the PISA assessment and students' enrolment at primary, secondary and tertiary education. The processes or initiatives that contribute to the significant outcome that reflects the high performing education system are listed out. Finally, some lessons that can be learnt from the high performing education system that any countries can aspire to benchmark the success stories are also shared.

• FINLAND •

Finland

An Overview of the Education System

Finland's society is relatively homogeneous. Out of a population of 5.3 million, only 3.8% are foreign-born, against an OECD average of 12.9%. Finland has a unique education system because it has progressed from mediocrity to being a model contemporary educational system and "strong performer" over the past three decades. It is helpful to illustrate congruencies between the developments of Finland's education system and the three stages of economic development following World War II.

- Enhancing equal opportunities for education by way of transition from a northern agricultural nation to an industrialized society (1945-1970).
- Creating a public comprehensive school system by way of a Nordic welfare society with a growing service sector and increasing levels of technology and technological innovation (1965-1990).
- Improving the quality of basic education and expanding higher education in keeping with Finland's new identity as a high-tech knowledge-based economy (1985 - present)

The Finnish education system has a parallel educational system until the early 1970s, which divided pupils at the age of 11 or 12 into one of two separated streams; grammar school and vocational school. There was practically no possibility to move between these streams once students have decided which pathway to follow. Figure 2.1 describes the structure of the education system in Finland before 1970.

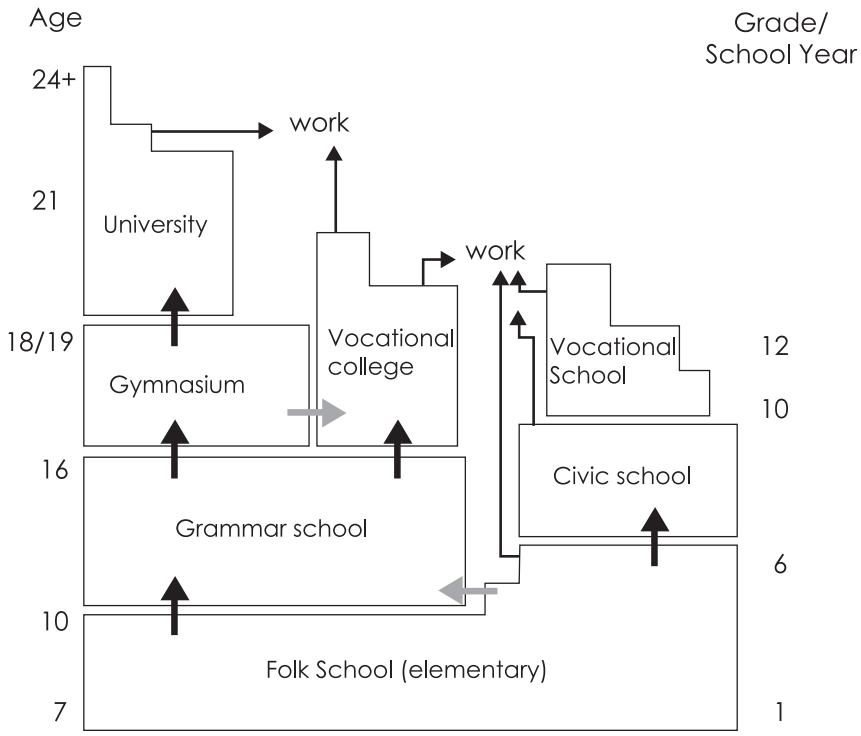


Figure 2.1 Structure of the education system in Finland before 1970

The new comprehensive school or *peruskoulu* system was poised for implementation in 1972. The central idea of *peruskoulu*, was to merge existing grammar schools, civic schools, and primary schools into a comprehensive 9-year municipal school. This meant that the placement of students after 4 years of primary education into grammar and civic streams would come to an end. All students, regardless of their socioeconomic background or interest would enroll in the same 9-year basic schools governed by local education authorities. Since the beginning of 2013, early childhood education has been part of the Finnish education system. Until then has been under the social and health administration.

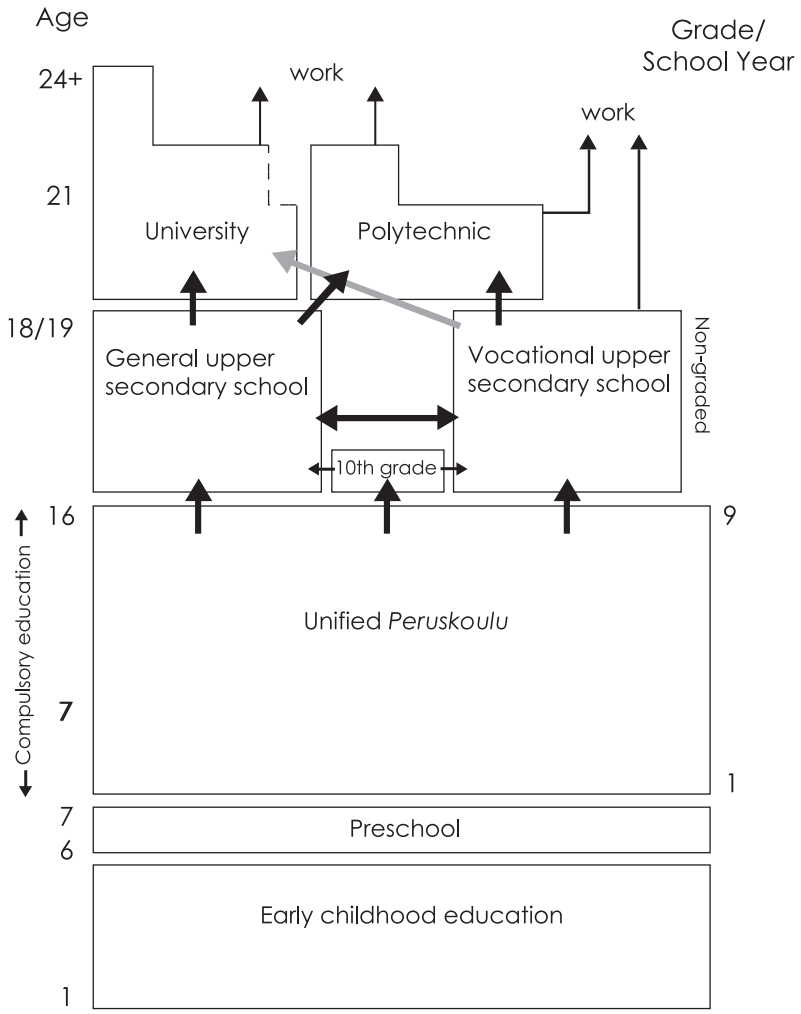


Figure 2.2 The education system in Finland in 2015

The National Curriculum for the Comprehensive School steered the content, organization, and pace of teaching throughout the country. While the structure of the comprehensive school was similar for all students, the National Curriculum provided schools with tools to differentiate instruction for different ability groups and personalities. However, ability grouping was eventually abolished in all school subjects in 1985. Since then, all students have studied according to the same curricular and syllabi. It is noteworthy that in Finland all education after the 9-year *peruskoulu* is noncompulsory. Rather than making upper-secondary education compulsory, Finnish education policies have relied on developing equal opportunities for all to participate in upper-secondary education as a matter of

individual choice, while at the same time creating incentives for young people to remain in the education system after the completion of compulsory education. Students who have passed the required courses in upper-secondary general school are eligible to take the National Matriculation Examination. The test is organized by the National Matriculation Examination Board and administered at the same time in all schools nationwide. There is no national examination for students graduating from upper-secondary vocational schools.

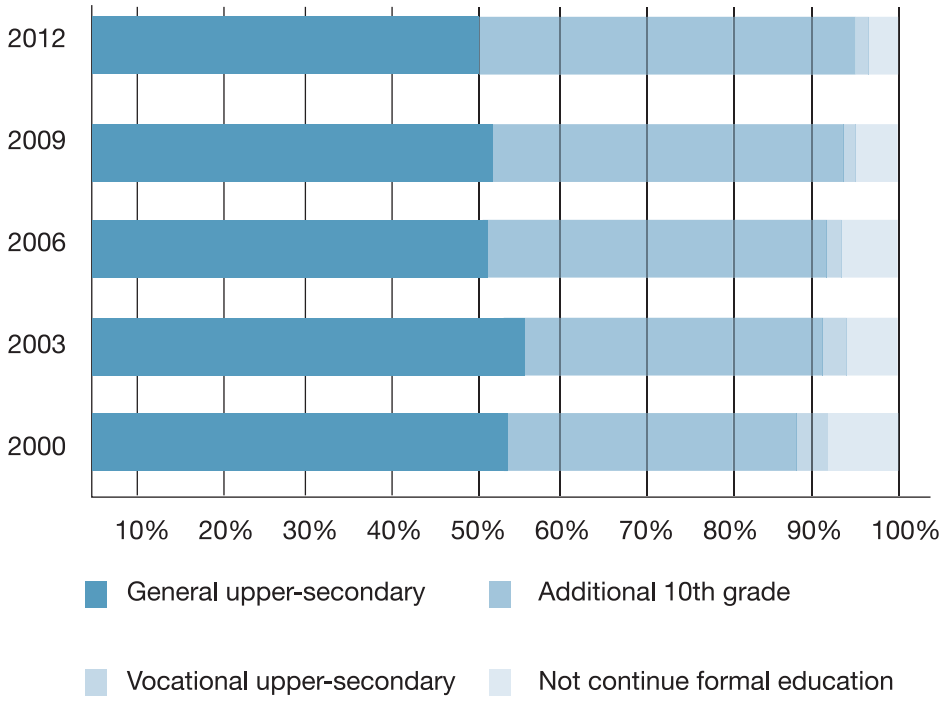


Figure 2.3 Transition from Peroskoulu to Upper-secondary Education as percentage of Age Cohorts between 2000 and 2012

b. The outcomes

Comprehensive school reform has proven to be a fruitful strategy to the Finnish education system. As the number of graduates from these schools has increased, so too has the demand for upper-secondary education. Annually, about 95% of those graduating from Peruskoulu immediately continue their studies in one of the two types of upper-secondary education settings or enroll in an additional 10th grade. In 2009, the number of students enrolled in general and vocational upper-secondary education stood at

50.6% and 41.9% respectively. In 2008, more than 40% of Finns between 20 and 29 were enrolled at university, well above the OECD average of 25 years of age.

Finland was the top performer in the PISA 2000 tests and it has consistently featured among the top performers since then. In 2009, the number of Finnish students reaching the top level of performance in science was three times the OECD average. Finland has about 7% between schools' variance on the PISA reading scale whereas the average between school variance in other OECD countries is about 42%. PISA 2012 showed some decline in Finnish students' academic performance however Finland has about 6% between-school variance on the PISA reading scales whereas the average between-school variances in Canada, the United States, and the United Kingdom were 18%, 23%, and 30%. (OECD, 2012).

The process: Finnish's success in education

High quality education in Finland is not a result of educational factors alone. Basic structures of the Finnish welfare state play an important role in providing all children and their families with equitable conditions for starting a successful educational path at the age of 7. Early childhood care, voluntary free preschool that is attended by some 98% of the age cohort, comprehensive health services, and preventive measures to identify possible learning and development difficulties before children start schooling are accessible to all in Finland. Finnish schools also provide all pupils with free and healthy lunch regardless of their socioeconomic situation. Total public expenditure on educational institutions as a percentage of GDP in Finland was 5.6% in 2007. This is less than the 5.7% OECD countries spent on average and significantly less than spending in the United States (7.6%of GDP) and Canada (6.1% of GDP). This indicates that good educational performance in Finland has been attained at reasonable cost. Finland has meticulously weaved educational factors to generate high quality education. Those factors are:

- Comprehensive school system
- Preparation of quality teachers
- Quality teaching and learning

Comprehensive school system

Comprehensive school system success can be attributed to the three particular aspects. First, bringing together a wide variety of students with often very different background and aspirations to learn in the same schools and same classes requires a fundamentally new approach to teaching and learning. From early on, the education of pupil with special needs and students with learning deficits were identified early enough and promptly treated. Special education becomes an integral part of school curricular, and all municipalities and schools soon housed expert trained to support special needs pupils.

Second, career guidance and counseling become a compulsory part of the comprehensive school curricular in all schools. Students need to be exposed and guided through systematic counseling on their options after completing basic school. Career guidance is intended to minimize the possibilities that students would make inappropriate choices regarding their future. In principle students have three options: continue education in upper secondary general school, enroll to vocational school, or find employment. Career guidance and counseling have been important factors in explaining low-grade repetition and dropout rates in Finland.

Third, comprehensive school requires teachers to employ alternative instructional methods; design learning environments that enable differentiated learning for different pupils, and perceived teaching as a high profession. This expectation has led to a new law on teacher education, emphasizing professional development and focusing research based teacher education.

Preparation of quality teachers

Teaching is consistently rated as one of most admired professions ahead of medical doctors, architects, and lawyers. Teaching is also regarded as an independent high profession that enjoys public respect and praise. Every year thousands of Finnish general upper-secondary school graduates, including many of the most talented, creative and motivated youngsters submit their applications to departments of teacher education in eight Finnish universities. Thus, becoming a primary school teacher in Finland is highly competitive. Successful teacher education candidates must also possess high scores, positive personalities, excellent interpersonal skills, and commitment to work as a teacher in school.

Teacher education is an important and recognized part of higher education in Finland. In the Acts on Teacher Education in 1978-1979, the minimum requirement for permanent employment as a teacher was raised to a master's degree. This legislative policy served as an impetus to transfer all teacher education programs from colleges to Finnish universities.

A broad-based teacher education curriculum ensures that newly prepared Finnish teachers possess well-balanced knowledge and skills in both theory and practice. Research- based teacher education plays an important role in Finnish teacher education programs. It integrates educational theories, research methodologies, and practice.

There is a close collaboration between subject faculties and schools of education. Subject teacher education is organized collaboratively and is coordinated to ensure both solid mastery of subjects to be taught and state-of-the-art pedagogical competencies for all graduates.

Quality Teaching and learning

Finnish teachers teach about 600 hours annually. Lower teaching hours provide teachers more opportunities to engage in school improvement, curriculum planning and personal professional development during their working hours. Teachers have many other responsibilities besides teaching. They assess their students' achievement and overall progress, prepare and continuously develop their school curriculum, participate in several school health and well-being initiatives concerning their students, and provide remedial support to those who may need additional help.

Finnish 15-year old students spend less time on homework compared to their peers in other nations. 'Minimum homework minutes' and other means have been introduced to make sure that students are kept busy studying after school.

Finnish schools do not employ standardized census-based test to determine their progress or success. Assessment in Finland can be divided into three categories. The first category is classroom assessment by teachers. This includes diagnostic, formative, and summative assessment of students as part of teaching and learning. Secondly is a comprehensive of student's progress after each semester. Students receive a report card that indicates their performance in academic and non-academic subjects as well

as behavior and engagement. A student's report card is always a collective professional judgment by his or her teachers. Thirdly, students' achievement in Finland is also assessed externally. Regular national assessments are carried out using sample-based methodology that includes 10% of the age cohort. School not included in these samples may purchase one or more of these tests from the National Board of Education to benchmark their performance to that of other schools. The only external "standardized" assessment of student learning is the National Matriculation Examination at the end of upper secondary school when students are at the age of 18 or 19.

Lessons from Finland

- Schools in Finland are focal centers for their communities. They provide a daily hot meal for every student, plus health and dental services, psychological counseling and a broad array of other services for students and their families.
- Finland has proven that giving accessibility and providing equity to all students can achieve educational excellence. The success of education reform is attributed to comprehensive school or Peruskoulu.
- The right move to upgrade primary school teacher education to the universities and promote teacher diplomas to a required master's degree in 1978 has attracted some of its most able and talented youth to become teachers.
- Teacher education has put much emphasis on systematic and research-based structure. Research based academic training has also enabled implementation of more radical national education policies. There is a close collaboration between subject faculties and school of education
- Teachers are entrusted to develop their own curriculum and given the full range of professional autonomy to practice what they have been trained to do; to plan, teach, diagnose, execute and evaluate.
- Inspections from external reviewer to assess teachers' work and benchmark quality school do not exist in the Finnish education system.
- Teachers emphasize on learning development rather than teaching students for grades. As a consequence every students regardless of their ability has the opportunity to learn together in the same class.
- There is no centralized examination until the students completed upper secondary schools. Therefore, teachers give importance on personalized learning and creative teaching as important components of schooling.

- A particular feature of the Finnish system is the “special teacher.” This is a specially trained teacher assigned to each school whose role is to work with class teachers to identify students needing extra help, and then work individually or in small groups with these students to provide the support they need to keep pace with their classmates.
- School principals have to be qualified to teach in the school that they lead. They also have to complete academic studies on educational administration and leadership offered by universities in Finland.

• SINGAPORE •

Singapore

An Overview of the Education System

In Singapore's education system today, students receive six years of primary education, and four to five years of secondary education, followed by two years at junior college, polytechnic or the Institute for Technical Education (ITE).

Primary education consists of a four-year foundation stage during which all students follow a common curriculum that emphasizes English, mother-tongue language and mathematics. Science is introduced from primary 3. Other subjects taught in primary school are civics and moral education, social studies, health, physical education, art and music.

After 10 years of general education, students go to post-secondary education, either in junior colleges (31% of students), polytechnics (43%) or ITE (22%). Academically inclined students can take A-levels during this period and then proceed to university. Students may also take diploma courses in technical or business subjects at polytechnics. Many polytechnic graduates who have done well also go on to university. Students with GCE O- or N-levels can take skill-based certificates in technical or vocational subjects at ITE. Outstanding ITE graduates can also apply to attend polytechnics or universities. About 25% of a cohort goes on to university in Singapore (the number of places has raised to 30% in 2015).

As a sovereign state since 1965, Singapore is one of Asia's great success stories. In less than half a century, it has transformed itself from a developing country to a vibrant modern economy. Education has been central to this process and a focus on teacher training and strong school leadership has been one of the key factors in Singapore's success.

Singapore has surged as an excellent country in the education system, which put it at par with the OECD countries. Its tremendous effort to raise the standard of education has been realized within one generation. The education system has evolved over the past 40 years in tandem with the changing economy. Lacking other resources, human resources were and still are seen as the island republic's most precious asset. Education

was seen, from the beginning, as central to building both the economy and the nation. Its job was to deliver the human capital engine for economic growth and to create a sense of Singaporean identity. The current system did not emerge perfectly-formed, but has developed in three broad phases as it was adapted to changing circumstances and ideas:

Early development phase: 1957-1978

Prior to independence, only the affluent were educated. At independence, most of Singapore's two million people were illiterate and unskilled. Therefore the focus of this "survival" period was on expanding basic education as quickly as possible. Schools were built rapidly. Teachers were recruited on a large scale. The schools that had been established by different ethnic groups were merged into a single Singaporean education system. A bilingual policy was introduced so that all children would learn both their own language and English. In the early 1970s, out of every 1 000 pupils entering primary grade one, only 444 reached secondary grade four after 10 years. And of these, only 350 (35% of the cohort) gained three or more passes in O-level examinations.

Efficiency driven phase: 1979-1996

Setting an ambitious goal from a third-league, labour-intensive economy to a second-league, capital and skill-intensive country, Singapore conscientiously prepared a strong foundation to further enhance their education system. Singapore moved away from its earlier one-size-fits-all approach to schooling that would create multiple pathways for students in order to reduce the drop-out rate, improve quality and produce more technically-skilled labour force needed to achieve the new economic goals. The multiple pathways included three types of high school: i) academic high schools, which prepared students for college; ii) polytechnic high schools that focused on advanced occupational and technical training and that could also lead to college; and iii) technical institutes that focused on occupational and technical training for the lowest fifth of students. The Curriculum Development Institute of Singapore was established to produce high- quality textbooks and instructional materials for the different pathways. A major goal of this second phase was to produce technical workers at all levels.

Knowledge and aspiration-driven phase: 1997 to date

With the proliferation of technological advances and the global knowledge economy, Singapore's education system shifted towards a focus on innovation, creativity and research.

One million foreign nationals with scientific, technical or managerial skills have been encouraged to work in Singapore in international corporations and in higher education. Singapore's three universities, and especially the National University of Singapore and Nanyang Technological University, have research partnerships with leading universities around the world with a focus in selected fields, including bioinformatics, information sciences and medical technologies.

To align with the dynamic changes of the environment and hold fast to the philosophy that "A nation's wealth in the 21st century will depend on the capacity of its people to learn", Singapore created a new educational vision, "Thinking Schools, Learning Nation". It represented a vision of a school system that can develop creative thinking skills, lifelong learning passion and nationalistic commitment in the young.

In "Thinking Schools, Learning Nation", abilities and interests of students are the prime concern. Hence curricula and assessment changes put greater emphasis on project work and creative thinking. A major resource commitment, involving three successive master plans, was made to information and communication technology (ICT) as an enabler of new kinds of self-directed and collaborative learning.

Major changes were also made in the management of schools. Moving away from the centralised top-down system of control, schools were organised into geographic clusters and given more autonomy. Cluster Superintendents, who were successful former principals, were appointed to mentor others and to promote innovation.

The old inspection system was abolished and replaced with a school excellence model. Each school therefore sets its own goals and annually assesses its progress towards them against nine functional areas: five "enablers", as well as four results areas in academic performance. There is an external review by the School Appraisal Branch of the Ministry of Education every six years.

To open up more flexibility in the curriculum and to engage students more deeply in learning, the idea of “Teach Less, Learn More” as the next step under the Thinking Schools, Learning Nation umbrella was introduced. “Teach Less, Learn More” aims to “touch the hearts and engage the minds of learners by promoting a different learning paradigm in which there is less dependence on rote learning, repetitive tests and instruction, and more on engaged learning, discovery through experiences, differentiated teaching, learning of lifelong skills, and the building of character through innovative and effective teaching approaches and strategies.”(OECD, 2011: p163)

Singapore education system had strong holding power and important strengths in literacy, mathematics and science. However, it also focuses on the soft skills that enable future learning and rebalance content, skills and character development to achieve a more holistic education.

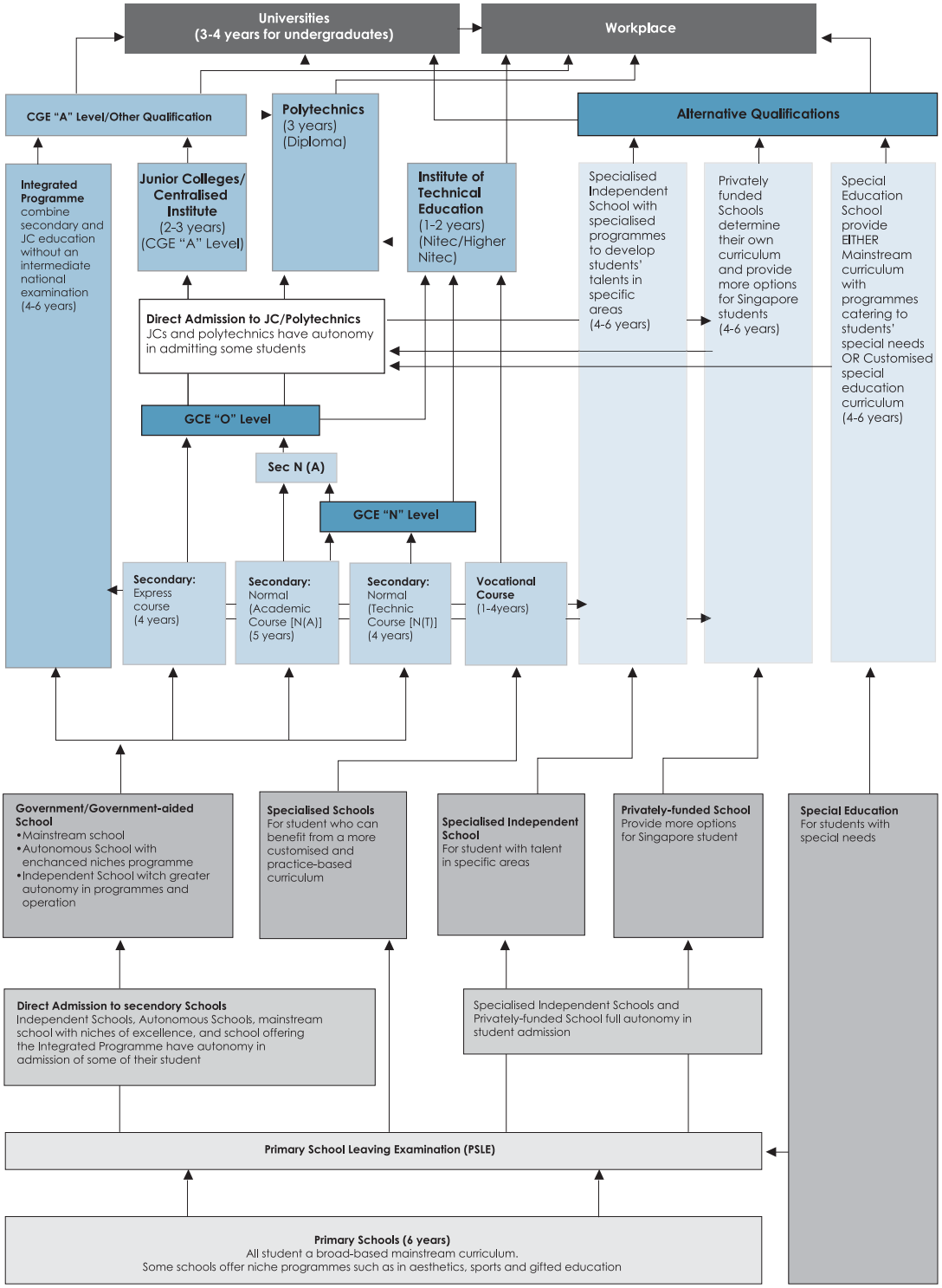


Figure 3.1 Singapore education system organization

Source: OECD (2011)

The outcomes

During the last decade, Singapore's education system has remained consistently at or near the top of most major world education ranking systems. Singapore's students were among the top in the world in mathematics and science on the Trends in International Math and Science Study (TIMSS) in 1995, 1999, 2003, 2007 and 2011. They came 4th in literacy in the 2006 Progress in International Reading Literacy Study (PIRLS). Their excellence is further underlined by the fact that Singapore was one of the top-performing countries in the 2009 and 2012 PISA survey. Singapore was rated as one of the best performing education systems in a 2007 McKinsey study of teachers (Barber and Mourshed, 2007), and was rated third best in the 2014 and 2015 IMD World Competitiveness Yearbook (IMD, 2014; 2015) for having an education system that best meets the needs of a competitive economy. At the higher education level, the National University of Singapore was ranked 26th in the world (2015-2016) and 1st in Asia in the Times Higher Education Supplement Rankings of World Universities in 2016.

The process: Singapore's success in education

Singapore has shown a great success in education performance. Singapore's success story in education is achieved through carefully planned elements with a strong focus on the education system itself. These elements are:

A clear vision of economic demand and education

Realizing that the country has no natural resources, Singapore placed high value on education as the key to economic development and national cohesion. Education spending rose to 3.6% of GDP in 2010, approximately 20% of total government expenditure and second only to defense. Singapore has a uniquely integrated system of planning. Critical manpower needs and future skills are fed to the education sector. The Ministry of Education and the institutions of higher and post-secondary education then use these skill projections to inform their own education planning, especially for universities, polytechnics and technical institutes. This means that the Ministry of Education can then design the policies and implement the practices that will meet their vision.

Interrelationships between policy makers, researchers and educators

The ministry is responsible for policy development, while National Institute of Education (NIE) conducts research and provides pre-service training to educators. NIE's research is channeled back to the ministry and is used to inform policy development. Since NIE professors are regularly involved in ministry discussions and decisions, it is relatively convenient for NIE's work to be aligned with ministry policies. NIE is Singapore's only institution for training prospective teachers, but professional in-service development for teachers comes from various institutions or sources besides NIE.

A well-planned policies implementation

Singapore developed a well-planned intertwine system in which key leaders of the ministry, NIE and the schools shared the responsibility and accountability. Any policies announced consequently supported by capacity building. To encourage more innovations, schools are given more autonomy. However, there are still strong alignment among the curriculum, examinations and assessments; incentives for students to work hard; and accountability measures for teachers and principals.

Providing equity and accessibility to all

To provide equity and accessibility to all, Singapore has made a wide and rapid expansion of schooling that led to universal elementary and lower secondary education by the early 1970s. In the second phase, streaming was introduced to reduce the high dropout rates from the system. Intervention system has been introduced for children who require additional support in learning to read. They are identified through screening tests at the start of first grade. These children are provided with daily systematic intervention by teachers in small groups (8-10 students) in learning support programmes so that they do not fall behind. About 12-14% of children need such support for reading. The curriculum includes phonics and English language development since many of the children speak languages other than English at home. Likewise the programme involves Mathematics. Another remarkable feature of the Singapore education system is the value, attention and resources it devotes to lower level achievers, This focus on "levelling up", so that the lowest stream gets very high quality training. The 'many pathways' approach (academic, vocational and technical training) caters for students with different needs and ability, proved that the government cares for every child, no matter what their ability or achievement level.

A strong focus on mathematics, science and technical skills

Singapore has put much emphasis and strong focus on the universal development of mathematics, science and technical skills. Students at primary and secondary level are compulsory to take mathematics and science. Mathematics begins from primary while science starts from primary three onwards. Students are taught by specialist teachers in mathematics and science as well.

From upper secondary onwards, there is a range of specialised mathematics courses at higher levels for those students who are interested. The Singapore "Model Method" also makes extensive use of visual aids and visualisation to help students understand mathematics. The concrete-pictorial-abstract model used is based on an understanding of how children learn mathematics. Teachers cover less material than in any other countries but deal with it in depth.

In teaching science, teachers use inquiry process through three domains i.e knowledge, skills and attitude. At the tertiary level, more than half of the programmes are oriented towards science and technology. Vocational education has been upgraded so that it would not be selected as the last resort. Institute for Technical Education (ITE) had been set up which transformed the content, quality and image of vocational education. Courses developed are in line with the demand of industries and ITE campuses have close ties to international corporations. Salary levels for ITE graduates have also been strong, and students now see the ITE track as a legitimate path to a bright future.

Quality teachers and school leaders

Selection: Prospective teachers are carefully selected from the top one-third of the secondary school graduating class, by panels that include current principals. Strong academic ability is essential, as is commitment to the profession and to serving diverse student bodies.

Training: All teachers receive training in the Singapore curriculum at the National Institute of Education (NIE) at Nanyang Technological University. They take either a diploma or a degree course depending on their level of education at the entry. There is a close working relationship between NIE and the schools, where all new teachers are mentored for the first few years. As NIE's primary purpose is training all Singapore teachers, there are no

divisions between arts and sciences and education faculties and the strong focus is put on pedagogical content.

Compensation: Teachers' salary are seen as equally attractive as other occupations for new graduates. There are many other opportunities within education for teachers.

Professional development: To sustain teachers' quality in their teaching and learning and to sustain their knowledge with the latest development, they are entitled to 100 hours of professional development per year. Much of the professional development is school-based. The content of the course is prepared by staff developers. Their job is to identify teaching-based problems in a school, for example, with a group's mathematics performance; or introduction of new practices such as project-based learning or new uses of ICT. Teachers can also enroll courses at NIE. Courses at the NIE focus on subject matter and pedagogical knowledge and lead towards higher degrees or advanced diplomas. Sharing of best practices among teachers can always be carried out at the Academy of Singapore Teachers, which was opened in September 2010.

Career advancement: Teachers are assessed annually after three years of teaching, to identify the career paths that would best suit them – master teacher, specialist in curriculum or research or school leader. Each path has salary increments. Teachers with potential as school leaders are moved to middle management teams and receive training to prepare them for their new roles. Middle managers' performance is assessed for their potential to become vice principals, and later, principals. Each stage involves a range of experience and training to prepare candidates for school leadership and innovation.

Performance appraisal: Teacher's performance is appraised annually by a number of people and against 16 different competencies. Elements of the appraisal performance include contributions to the academic and character development of the students under their charge, collaboration with parents and the community and contributions to their colleagues and the school as a whole. Teachers who do outstanding work receive a bonus from the school's bonus pool.

Leadership selection and training: In Singapore, young teachers are continuously assessed for their leadership potential and given opportunities to demonstrate and learn, then being promoted to head of department at a relatively young age. Some are transferred to the ministry for a period of time. After these experiences are monitored,

potential principals are selected for interviews and go through leadership situational exercises. If they pass these, then they go to NIE for six months of executive leadership training, with their salaries paid.

Lessons from Singapore

Singapore emerged as one of the greatest countries in Asia specifically in economic development and excellent education. Its tremendous transformation within one generation leaves a good example as a role model to other countries. Key examples that can be learnt from Singapore education system are as follows:

- Visionary leaders. A strategically well-organised plan to reform the country's economy with no natural resources and building up foundation in human resources reflect its visionary leaders. Leadership in Singapore prepares their human capital specifically in science and technology by strengthening their education system, recruiting the brightest people to join the government machinery, creating jobs and reducing economic imbalance and educational achievement among the multi-ethnic society.
- Close links between policy makers, researchers and implementers. Singapore has shown a close tripartite relationship between the Ministry of Education, NIE and the schools. Research findings concerning pedagogy and new approaches from NIE will be supplied to the ministry for policy development. The ministry will then share them with the schools. Teacher preparation programme at NIE will fully utilize the models and findings from the research. In Singapore, whenever a policy is developed or changed, there is enormous attention to the details of implementation – from the Ministry of Education, to the National Institute of Education, cluster superintendents, principals and teachers.
- Strong emphasis on mathematics, science and technical skills. Strong focus on these three areas is linked with the government's vision to produce more sophisticated skilled workers and consequently propelled boost economic development.
- Curriculum, instruction and assessment that match the standards. Serious attention to curriculum development has produced strong programmes in mathematics, science, technical education and languages, in particular, and has ensured that teachers are well-trained to teach them. Having been very successful as a knowledge transmission education system, Singapore is now working on curriculum, pedagogy and assessments that will lead to a greater focus on high-level, complex skills.

- High quality teachers and principals. Teachers in Singapore are best selected from top one third of the best secondary school graduating class. Teachers are annually assessed to determine their talent whether to choose their path as a master teacher, specialist in curriculum or research or school leader. Those who have talents to become a school leader will undergo school leadership training.
- Strong central capacity and authority to act. The Ministry of Education in Singapore is staffed by knowledgeable, pragmatic individuals, trained at some of the best universities in the world. They function in a culture of continuous improvement; constantly assessing what is and isn't working using both data and practitioner experience.
- Adapting best practices from other countries. Singapore believes that there are no perfect education system in the world and there are pockets of excellence that can be benchmarked from other countries. Hence educational officers and teachers are sent abroad to countries like Australia, United States, Hong Kong, Sweden and Scotland to examine new approaches.

• CANADA •

Canada

An Overview of the education system

Canada education system is de-centralised. It is the only country in the developed world that has no federal office or department of education. Education is the responsibility of its 10 provinces and 3 territories. Four of those provinces hold approximately 80% of Canada's 5 million students: Ontario (2 million), Quebec (1 million), British Columbia (610 000) and Alberta (530 000).

Canada has one of the highest rates of immigration per capita in the world, with 40,000 immigrant children joining its public schools every year. Ontario, Canada's largest province attracts a high proportion of immigrants. Canada takes in about 250 000 immigrants per year (in a country of approximately 34 million inhabitants). Given the size of the land area, the relatively low-density population and low birth rates, immigrants are seen in Canada as an important and needed resource. All of the major political parties currently support either sustaining or increasing rates of immigration; there is no popular support for restricting immigration.

Patterns of immigration have shifted over time. Until the 1970s, the majority of immigrants came from Europe; over the past 40 years, most have come from Asia and the developing world. In 2007, the leading source countries of Canadian immigrants were China and India (about 28 000 each), the Philippines (20 000), and Pakistan (10 000). Smaller groups of immigrants come from Algeria, Colombia, France, Iran, Romania, Russia, South Korea, Sri Lanka, the United Kingdom and the United States, each of whom sends more than 3 500 immigrants per year. The fact that 60% of immigrants are selected on the basis of their ability to make an economic contribution creates a highly educated immigrant class. In total, 23% of Canadian workers in 2008 were born abroad, as were 49% of doctorate holders and 40% of those with masters' degrees.

PISA results suggest that within three years of arrival in Canada, immigrants score an average of 500 on the PISA exam, which is remarkably strong by international standards. For comparison's sake, in the 2006 PISA assessment of reading, Canadian first generation of immigrants scored an average of 520 points, as opposed to less than 490 in the United States and less than 430 in France. Canada is also one of very few countries where there is no gap between its immigrant and native students on the PISA.

There are three factors that influenced the results. First and most importantly, the majority of immigrants are selected on the basis of their ability to contribute economically thus, many immigrant children have highly-educated parents. A 2006 OECD report found that, on average, the first generation of Canadian students had parents with as many or more years of education as native-born parents. Canada was one of the few countries in which immigrant students had access to equal or greater resources than native-born students. Specifically, student/teacher ratios, physical infrastructure, classroom climate, and teacher morale were on average higher for the immigrant students sampled than for native students (OECD, 2006).

Second, Canadian multiculturalism provides a distinct philosophy that seeks to both respect the importance of native cultures while also incorporating immigrants into a distinctively Canadian identity.

Third, in some of the provinces that have had the largest influx of immigrants, an explicit policy has sought to support the success of these students. In British Columbia, for example, students participate in the regular curriculum, but the ministry provides funds for additional language support if a series of criteria are met. These include: i) evidence that the student lacks proficiency and will not reach it without additional support; ii) an annual instruction plan is prepared that meets the needs of the student; iii) a teaching specialist participates in the design and review of the plan; iv) the school must provide pull-out and in-class support for the student, as well as support and training for the respective teachers. All in all, Canada has a positive and reinforcing cycle when it comes to immigration and educating immigrant students.

The responsibility within the provinces in Canada is divided between the central provincial government and more locally-elected school boards. The provincial government is responsible for setting the curriculum, determining many major policies for schools and providing the majority, if not all, of the funding for schools (funding patterns vary slightly across provinces). Local school boards are elected. They employ staff and appoint principals and senior administrators. They also set annual budgets and make decisions on some programmes. Over time, the number of districts has shrunk considerably through consolidation processes.

Teacher training takes place in universities, although the standards for certification have traditionally been set by the provinces. In 1987, British Columbia was the first to make its

teachers self-governing, granting to the British Columbia College of Teachers exclusive responsibility for governing entry, discipline, and professional development of teachers. In 1996, Ontario followed suit, establishing the Ontario College of Teachers, which governs similar functions.

The Canadian system is also internationally distinctive for its efforts to balance respect for diversity of language and religious affiliation with province-wide educational goals. While initial struggles in Canada were around religious differences, in more recent years language has shown greater salience. Section 23 of the Canadian Charter of Rights and Freedoms protects parents who speak a minority language (English or French), giving their children the right to receive primary and secondary instruction in their native language.

Students in Canada are grouped by abilities that are similar to the United States' system. Elementary school-aged children are often placed in ability groups within heterogeneous classrooms. Students in secondary schools are placed into streams or different pathways, based on perceived ability levels. Most high schools have the general, advanced, vocational, or university pathways for post-secondary entrance. Yet, these practices have faced many criticisms for not sufficiently challenging students in the lower pathways due to the rather limited academic expectations for weaker students.

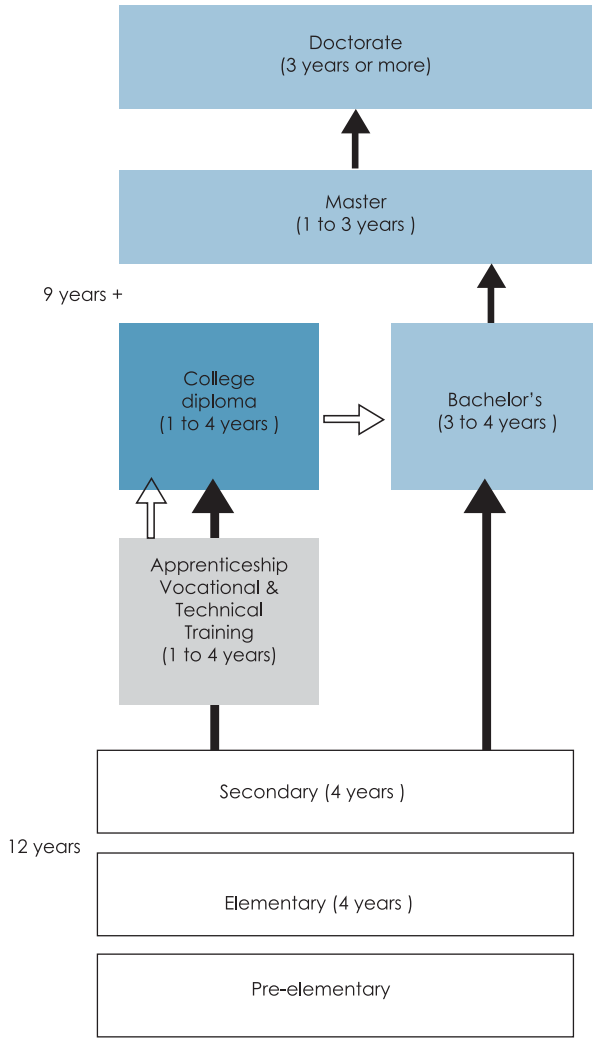


Figure 4.1 Canada education system organization

The first decade of the 21st century has seen a set of educational reforms which emphasises on the centralised standards and assessments which also seen in the earlier reforms of the 1980s and 1990s. However, this latest reforms include a strong effort on capacity building among teachers and better strategies for education improvements.

The outcomes

Since 2000, Canada has become a world leader in its sustained strategy of professionally driven reform of its education system. Not only do its students perform well, they

perform well despite their socio-economic status, first language or whether they are native Canadians or immigrants.

After the release of the PISA rankings in 2000 that Canada found itself a leader of the pack. These results have been confirmed in subsequent PISA tests, which have revealed that Canada has both strong average results as well as less dispersion among its high and low socio-economic status (SES) students than many other nations (OECD, 2011). Canada is one of the top-performing countries in PISA and one of very few that shows no gap between immigrant and native students. One example of the provinces that has shown tremendous achievements is Ontario. Ontario's education reform has increased elementary literacy and numeracy level, improved graduation rates and reduced the number of low-performing schools.

The immigrants score an average of 500 on the PISA exam, which is remarkably strong by international standards and well ahead of countries like the United States and France. Between 2003 and 2010, Ontario's high school graduation rate rose from 68% to 79%. The provincial government's target is to raise it to 85%. Ontario's Literacy and Numeracy initiative raised the average pass rate in Grade 3 provincial exams in reading, mathematics and writing from 55% in 2003 to 70% in 2010. The provincial government aims to raise it to 75%.

The process: Canada's success in education

Most Canadian high school students do well in education, independently of their socio-economic status, their first language or whether they were born in Canada or elsewhere. A strong PISA results revealed that three factors influenced the results namely Canadian culture; the Canadian welfare state; and three policy- specific factors (teacher selectivity, equalised funding, and provincial curricula).

i. *Cultural factors*

   In terms of culture, parents in Canada are generally supportive of their children's education and can be seen as an asset to the schools. Comparative PISA data on the leisure reading habits of Canadian students suggests that Canadian students are more likely than any other children in the world to read daily for pleasure (Tibbetts, 2007).

ii. *Welfare state*

Canada does have a strong national welfare state. Children and their parents have access to national health insurance, and adults are protected from the vicissitudes of capitalism by a strong social safety net. The idea of a welfare state and a common good is much more firmly rooted in Canada. The idea that health care and other social services are a right and not a privilege carries over into education, where there is a broadly shared norm that society is collectively responsible for the educational welfare of all of its children.

iii. *Policy factors*

In terms of policy, despite the lack of a national co-ordinating body, a number of respondents suggest that the provinces are quite similar in some of their key policies. Canada possesses a Council of Ministers of Education (CMEC), which is the forum through which the ministers of education in the respective provinces can meet for co-ordination purposes.

Three common policy factors (in addition to the welfare state and cultural reasons) were highlighted as potentially important to pan-Canadian educational success:

- The establishment of province-wide curricula. These are developed by the respective ministries of education through a process of extensive consultation with groups of teachers and subject matter experts. In some provinces these curricula are fairly detailed, whereas in others they serve more as guidelines of what should be learned and when.
- The high degree of selectivity in choosing teachers. Canadian applicants to teachers colleges are in the "top 30%" of their college cohorts. The education within these teacher training institutions is seen by some to be of high quality.
- Equalised funding. Funding has shifted entirely or almost entirely to the province level thus enables the provinces to provide funding to offset the greater neediness of some of their students.

Lessons from Canada

i. ***Determined and committed leadership***

The prime focus of the premier is to keep focused on the student achievement agenda. The two central commitments that guided the work of the ministry: increasing literacy and numeracy levels in elementary schools, and increasing the high school graduation

rate. Long-term quantitative targets are outlined for each of these goals: to improve the provincial passing rate in literacy and numeracy from 55% to 75%, and to increase the high school graduation rate from 68% to 85%.

The ministry put much emphasis on capacity building approach and struggling schools. These schools would receive additional support and outside expertise rather than be punished or closed.

Each high school was given support to hire a provincially funded Student Success teacher and was required to set up a Student Success team to identify students showing early indicators of academic struggles and design appropriate interventions. An important element in the development of the Student Success strategy was the creation of a new programme in high schools called the High Skills Major. This programme aimed to identify high school students who were not confined to the traditional academic curriculum and given a different list of courses.

ii. ***Teacher and principal quality.***

Canada continues to draw its candidates from the top third of secondary school graduates, signifying that the government had a solid basis for believing that its trust would pay off.

Ontario has paid special attention to leadership development, especially for school principals. In 2008 the government initiated the Ontario Leadership Strategy that spells out the skills, knowledge and attributes of effective leaders. Among the elements of the strategy are a strong mentoring programme that has now reached over 4 500 principals and vice-principals, and a new province-wide appraisal programme for school leaders.

iii. ***Highlighting much value on education***

The strong cultural commitment to education seems to be an important underlying national value that helps explain Canada's overall strong performance despite a minimum governmental role in education. The commitment to the welfare of children helps to reduce the achievement gaps among the schools.

iv. ***High expectation for universal great achievement***

The extraordinary performance of Canada's immigrant children is largely a reflection of the high expectations immigrant families have for their children, and of the fact that those high expectations seem by and large to be held by educators as well.

• GERMANY •

Germany

An Overview of the Education System

Germany is a country that pioneered various aspects in education. One is they offered a free public basic education to all. Germany was the first country to develop a modern research university. The Gymnasium, a model for secondary schools was designed to prepare students for the modern research university; and *Realschule*, a training model that prepares students to be technicians and low-level civil servants, are two of the world's most compelling models for providing a nation with highly trained workers in every field of *endeavour*.

Germany has a highly decentralized education system. While the federal education ministry has a broad and general role, the nation's 16 federal states have primary responsibility for schooling. Policies covering almost everything from teacher training to curricula are decided at state level. The states coordinate their policies in the framework of a standing conference of education ministers, the *Kultusministerkonferenz*, or KMK.

In the early 20th century, Germany had uniform elementary schooling with compulsory elementary education for all children aged 6 through 10, providing four years of basic education. This policy demonstrated Germany's commitment to a state-run system of basic education. After the completion of elementary school, students were streamed into one of three types of school:

- *Volksschule* – Low ability students (who are the majority), were streamed into the *Volksschule* (People's School, later call the Main School or *Hauptschule*) where they would get a few more years of education, and receive a qualification that qualifies them to apply for training leading to working-class jobs in Germany.
- *Realschule* – Students with higher ability were streamed into the *Realschule*, where they would prepare for a qualification entitling them to apply for training that would lead to jobs such as clerks, technicians and lower-level civil servants.
- *Gymnasium* – Students with the highest ability were streamed into the *Gymnasium*, where they would be given a broad preparation in the humanities and prepared to take examinations for the *Abitur*, which was the sole gateway to the professions like teaching and the upper levels of the civil service. These three types of schools are called the *tripartite* system.

Germany has a strong system of apprenticeships that trains many school-leavers for jobs. Around 60% of all young people learn a trade within its dual system of vocational education and training (UNESCO, 2010). Students who complete a secondary education in Germany are invited to become apprentices by firms, with their wages determined at a national level in a process managed by the government. This is called a dual education system because it combines apprenticeships in a company and vocational education at a vocational school in one programme. In the company, the apprentice receives practical training which is supplemented by theoretical instruction in the vocational school.

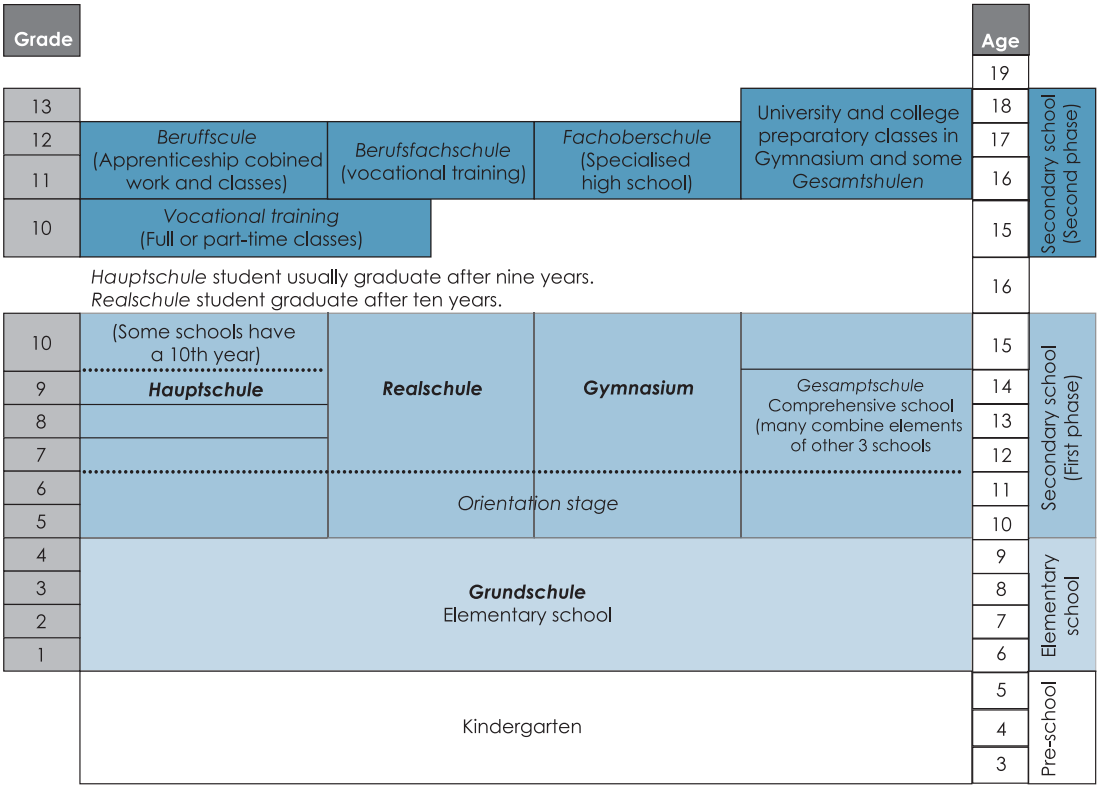


Figure 5.1 German Education System

Responding to the issues that contribute to students' quality in education for instance socioeconomic status, tripartite structure of German secondary education and an early streaming to a specific secondary school at the age of ten, different states have responded to these issues in different ways:

- A few states delayed the assignment of students to the tripartite system until they were 12 rather than 10 years old.
- More states chose to combine the Realschule and the Hauptschule into one school.
- Some states allowed students in any of the three types of lower secondary school to go to any type of upper secondary school. This greatly reduced, though did not entirely eliminate, the tracking system, because many secondary schools had their own streaming systems to differentiate students according to ability.
- Some states introduced or reintroduced comprehensive secondary schools, which any child can attend and which offer the whole range of qualifications. However, this option is not offered throughout the country, and only in parallel with some or all of the options just listed. One obstacle to this was the bad reputation of these schools caused by their poor introduction in the 1970s.
- Some states decided to allow several of these options to coexist side by side.

The outcomes

The PISA 2000 results had been an eye opening to the Germans as they thought that their education system is one of the world's most effective, fair and efficient school systems. Germany's schools ranked below average compared to the other PISA-participating countries and ten years into the 21st century, Germany has substantially improved its position in the PISA league tables.

- Germany's scores in reading and literacy improved to 491 in the 2003 PISA tests, 495 in 2006 and 497 in 2009. In mathematics, they advanced from 503 in 2003 to 513 in 2009; and in science from 516 in 2006 to 520 in 2009.

- Despite increased spending on early childhood education, these results were achieved without significant overall increases in spending on education. Germany spent 4.7% of its gross domestic product on education in 2008, down from 4.9% in 2000 and compared with an OECD average in 2008 of 5.7%.

- As of mid-2009, Germany had 4,283 Hauptschulen, 2,625 Realschulen, 3,070 Gymnasien and 1,363 schools offering both Hauptschule and Realschule courses. There were also 705 comprehensive high schools, known as Integrierte Gesamtschulen.

The process: Germany's success in education

The quality of education system in Germany showed that there was a correlation between children's command of German on entering elementary school and their subsequent performance. Therefore the government has come out with a prompt action to address the issues of proficiency in German language for children whose family does not speak German at home. The language training is introduced to the kindergarten level children so that by the time they reach elementary school they will be able to cope with the lessons at the same rate with their Germans counterparts.

The PISA and data analysis showed that the standards of students were in fact low and highly variable. This was due to the aversion of formal measures of student achievement based exclusively on examination performance. The whole German education system also had a real aversion to the use of empirical evidence and rigorous analysis of data as the basis of educational decision-making. Policy was based on values, not on data. Several initiatives have been proposed as part of the education reform to elevate the quality of the system.

i. *Common standards*

In 2003 and 2004, the Council of ministers decided to develop national educational standards for Grade 4 in primary school in German and mathematics; and standards for German, mathematics, a first foreign language (English or French), and science (biology, chemistry and physics) for Grade 9/Grade 10 in lower secondary school.

In 2007, additional standards had been introduced at the end of upper secondary school in seven subjects: mathematics, German, French, English, biology, chemistry and physics.

These performance standards are described in some subject-specific competencies that students are expected to meet throughout Germany. They emphasize the kind of skills and competencies measured by the PISA assessments where appropriate.

ii. *Assessments based on standards*

Common assessments has been developed for comparing the performance of the 16 German states using common national scales, for 3rd graders in elementary school, 8th graders in certain secondary schools and 9th graders in others. Furthermore Germany committed in participating in three major international assessments namely PISA, TIMSS and PIRLS (Progress in International Reading Literacy Study)

iii. *A systematic monitoring system*

A new institution has been developed in 2004 – the Institute for Educational Progress to analyse the data and disseminate the information regarding the standards and the assessment. The government also put much emphasis on research to inform policy and practice.

iv. *Improving teacher quality*

As shown in the PISA 2000 results, Germany's teacher is the main source of the quality problem. Many of them were hired during the early seventies and formed an age-homogenous teaching staff with the lack of skills in dealing with the latest development especially with the immigrant students.

To upgrade the quality of the teacher, the top third of secondary schools students are selected to join the teaching profession. Future teachers will go to university, where they will major in two subjects in which they have a special interest in and study those subjects at the same level of challenge as other university students majoring in those subjects, thus producing a high level of subject matter knowledge in these future teachers. These teachers candidates still need to take another two-year programme of combined supervised teaching and related course work before they could enter the workforce. They had at least an additional year of mentoring and close supervision, as well as an examination, before they are allowed to assume the role of a full professional teacher.

v. *Longer school hours*

Comparing school hours from other countries that participated in the PISA assessment, German students spend much less hours in school. German students in general stayed up in schools until 4 pm or later. However this is optional and not compulsory to all schools.

vi. *Increasing autonomy to school heads*

Previously school heads had less discretion in managing their school. However after the PISA shock, schools have more authority over the school budget, staffing decisions and programmes. Research has shown that the school performance increased when there is a central exam and strong accountability. Schools will flourish when autonomy is given to school to decide suitable ways to improve their school performances in education.

Lessons from Germany

Quality teachers

Germany selects its teachers from the top third of its high school graduates. The preparation of most teachers in university is more extensive than it is for teachers in other countries and for most other professions in Germany. The recent reforms require the teacher education programmes to provide teacher candidates with skills enabling them to diagnose and address the specific problems faced by struggling students. All states require teachers to participate in an extended period of supervising and mentoring by master teachers before they can assume their duties and become regular full-time teachers.

Benefits from the dual system

Germany's education system has produced students with skills and ability that are needed most by the demand of the advanced countries. This can be attributed to the dual system where flexible combination of formal schooling and apprenticeship represents a very powerful approach to providing students with skills, knowledge and motivation before permanently being employed.

Common standards and curricula

Germany responded to the decline of ranking in PISA by having common curriculum frameworks and common performance standards. The variance and inconsistencies of the performance among the schools throughout all the states in Germany are monitored through sound research and data analysis. After the PISA 2000 results, Germany became an avid, determined international benchmarker. Not only did Germany send teams all over the world to learn from other nations, but it quite deliberately built into its own national testing regimes participation in some of the international comparative testing regime.

• CHINA •

China - Shanghai and Hong Kong

An Overview of the Education System

China has a long tradition of valuing and prioritizing education highly. It started with putting much emphasis on examination dated from 603 AD as an invaluable tool for the public to become government officials, to be appointed as ministers, even married princesses and enjoyed glorious home-coming ceremonies. Since then education and examinations have become stepping-stones for the society to climb up the ladder of success and prosperity.

The education system has undergone different phases of development beginning with the rather rigid Russian model of the 1950s, the period of "renaissance" in the early 1960s, disastrous damage during the Cultural Revolution (1966-1976), rapid expansion during the 1980s and 1990s, and the move towards massive higher education in the 21st century. China has made a tremendous progress and achievement after the Cultural Revolution ended in 1976. Teachers and teaching have become a prime aim for the government to improve the quality education quality.

In the major cities such as Beijing and Shanghai teaching has become the profession of choice. One of the main reasons is the improvement in teacher's salary. However the disparity of quality teachers and quantity are still persisting between the major cities and other provincials in Mainland China. Class sizes in Mainland China are generally large: the national norm is 50 students. However, in rural areas where good schools are scarce, it is common to see classes of over 80 or in the extreme case, over 100. In major cities i.e Shanghai where the population is declining, the government has to reduce the class size in order to avoid major teachers lay off. This has led to the decrease of the teachers' workload and thus created opportunities for them to creatively conduct teaching and learning activities that would be impossible in larger class.

China has put a systematic structure of teaching and learning. A "teaching-study groups" concept has been adopted by a group of subject-based teachers where they will engage in studying the teaching and learning of their senior secondary teachers on a daily basis. The study group will meet according to the scheduled timetable to discuss further lesson scheme for the following week. The "teaching-study group" is supervised for each of its

subject areas by the “teaching-study office” in the Education Bureau (in a rural country or city district), which is in turn supervised by the relevant “teaching-study office” in the Education Department in the provincial or municipal government. Teachers observe their peers teaching for different purposes, for gaining new skills and knowledge (by new teachers), for enhancement and mentoring (by senior teacher) and for monitoring and performance evaluation (by the school principal). Such teaching protocols are present throughout China, from remote villages to prosperous cities. It would be interesting to note that almost all officers in the government education authorities, both at municipal and district levels, started as school teachers.

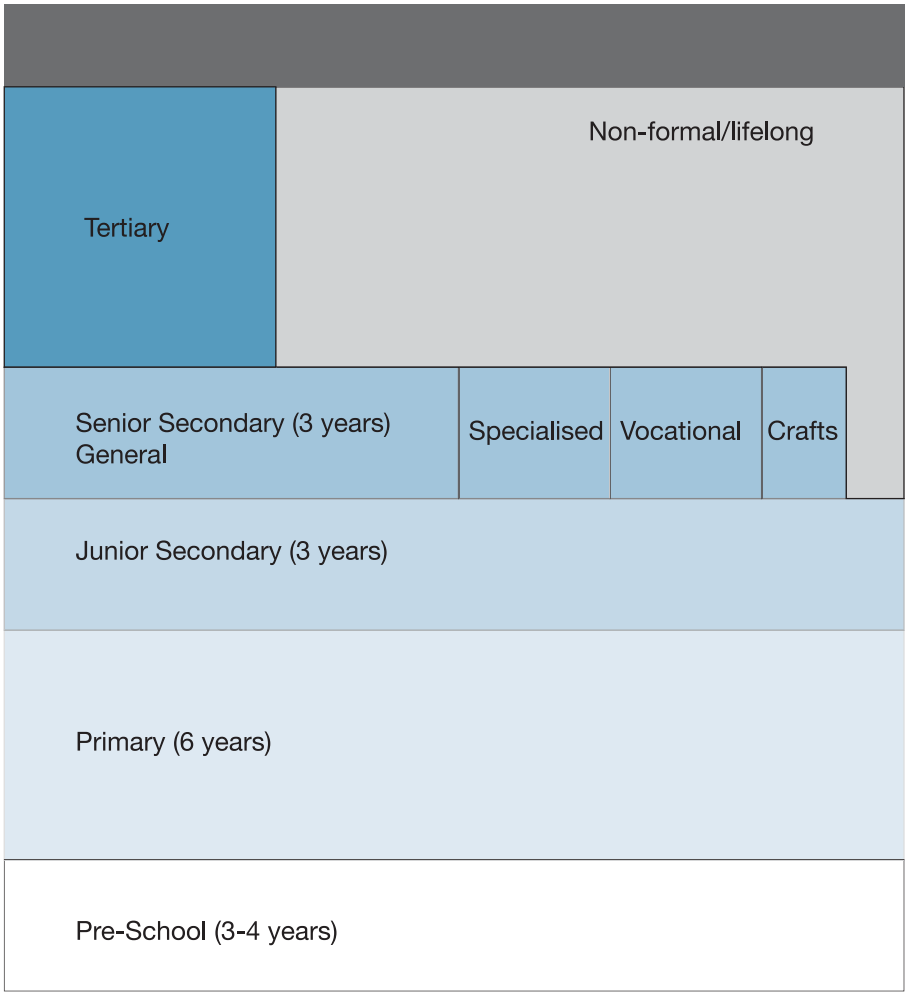


Figure 6.1 China education system organization

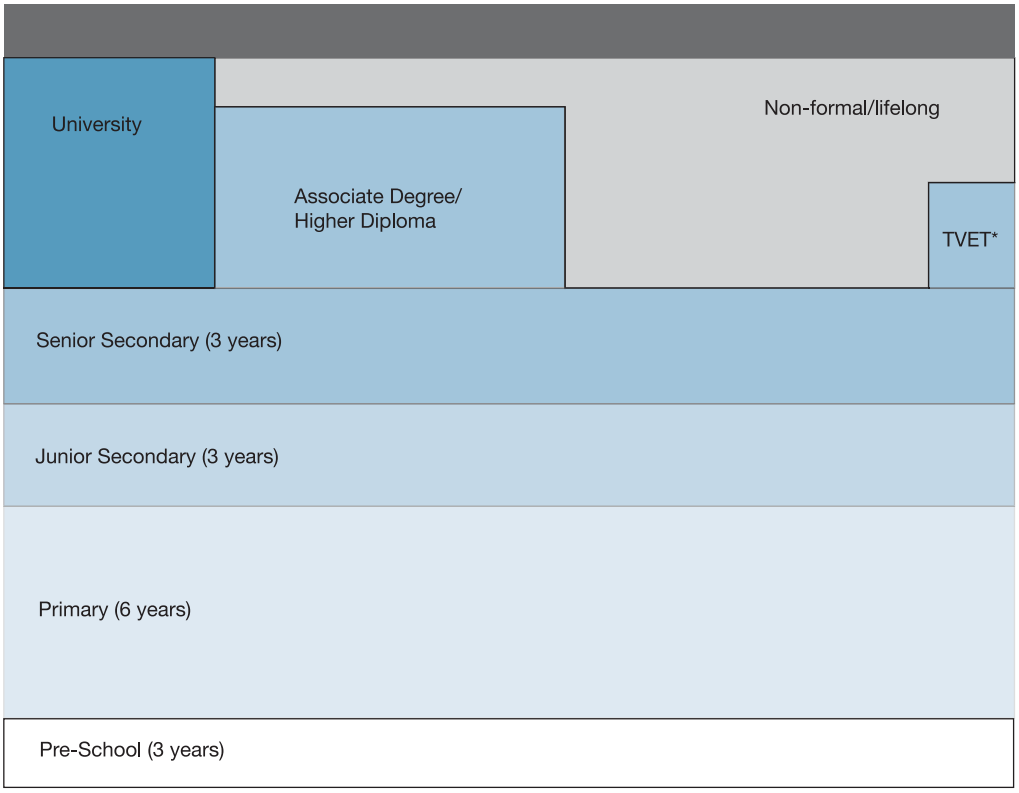
Continuing to improve the education system has become the prime agenda of the government. The latest initiative is the Outline for Medium and Long-term Development and Reform of Education up to 2020, which aimed to improve education in the next decade. One of the objectives is to introduce universal pre-school education. As China is so much into examination oriented, the education reformers suggested the system should move away from rote learning and regurgitate information on the test paper to increase students' participation in learning activity, promote communication skills and focus on critical thinking and problem solving. These suggestions have made it clear in the A major document issued in 2001.

Further discussions will focus on two major Chinese cities; both are vibrant economies namely Shanghai and Hong Kong, as an example in making significant development in education development. Shanghai is one of China's most developed urban areas, while Hong Kong, despite having the same cultural background, is a rather different society under the "one country, two systems" political arrangement. However their reform discourse is focusing on students' learning with different approaches due to dissimilar political frameworks.

Shanghai is the largest city in China with a population of 20.7 million. It is also synonymous as China business center. With the cultural tradition about education never fade, Shanghai was among the first cities to achieve universal primary and junior secondary education and was also among the first to achieve almost universal senior secondary education. There are several initiatives has been adopted in Shanghai to sustain high achievement and develop quality in education specifically reforming exams, emphasizing on student engagement, reforming curriculum and overcoming disparity and inequality.

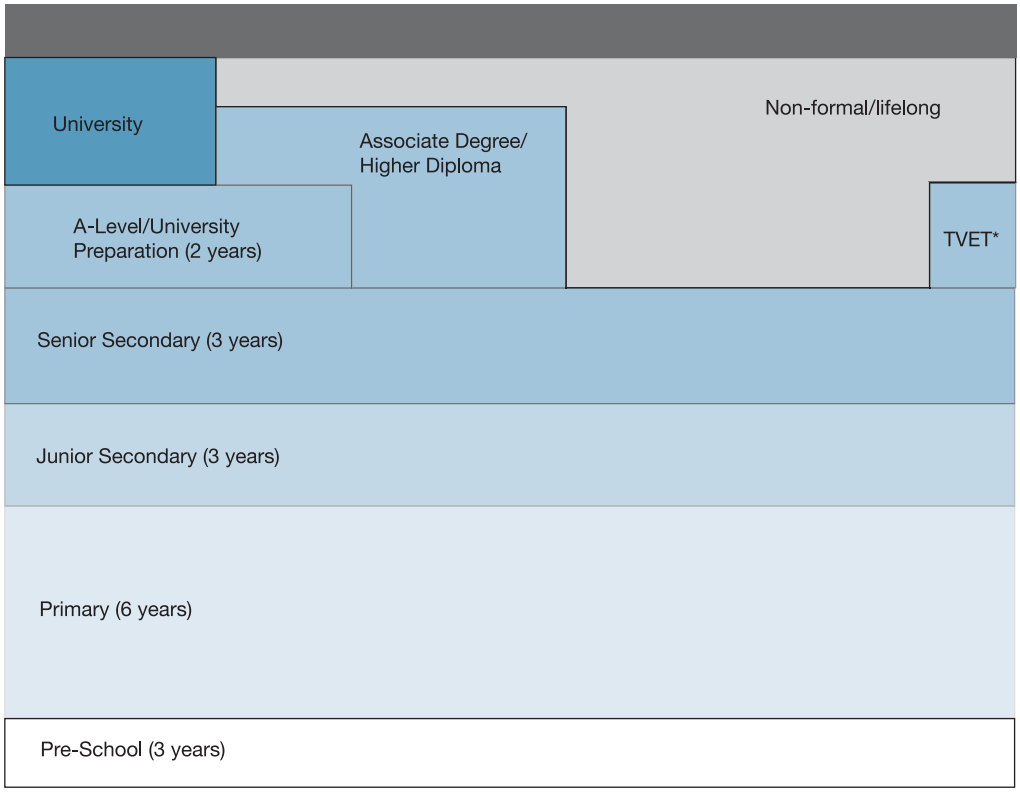
Meanwhile Hong Kong's education system is very much part of the British colonial legacy. The school system still maintains the British approach of five-year secondary schooling (Forms 1-5), which ends with a Certificate of Education Examination, the crucial certification for a student's future. As The Mainland is having their education reform as a result of economic development and changes in the demand of the society while Hong Kong is developing a comprehensive reform discourse as well in 1999. This was due to dissatisfactions among parents, teachers, employers and the society as a whole pertaining to the standard of education particularly when comparing public schools to international schools. Due to extensive research among other education systems around the world and the demand of the society, three significant aspects emerged to

be considered in the education reform specifically the system's structure, its curriculum and assessments. In 2001, as a first step in the reform, public assessments after primary schooling were abolished with immediate effect. This has changed the pedagogical approach from transferring of information and drilling students for examinations to students' active learning.



*Technical and Vocational Education and Training

Figure 6.2 Hong Kong education system organization until 2012



*Technical and Vocational Education and Training

Figure 6.3 Hong Kong education system organization after 2012

The outcomes

China's education reform after the Cultural Revolution 1976 has shown remarkable improvements. With the Law of Compulsory Education enacted in 1986, which required every child to complete nine years of formal schooling – six years of primary school and three years of junior secondary school, China had basically achieved this goal by the mid-1990s. Official statistics (for 2009) show a net enrolment of 99.4% at the primary school level. The gross enrolment ratio for junior secondary school was 99%.7 In the same year, gross enrolment at senior secondary level, both general and vocational, was 79.2%.

China nonetheless has the largest number of higher education students in the world, much higher than the United States (around 18 million in 2007), which was the second largest, and above India (around 13 million in 2007) (UNESCO Institute of Statistics, 2009).

Shanghai and Hong Kong can be the best example in reforming education in China. Shanghai was among the first cities to achieve universal primary and junior secondary education and was also among the first to achieve almost universal senior secondary education. According to the Shanghai Yearbook 2009 (Shanghai Municipal Government, 2010), enrolment at the age of compulsory education was above 99.9%, and 97% of the age cohort attended senior secondary school (general and vocational). It is notable that enrolment for preschool programmes was 98%, which already surpasses the new national preschool education goal for 2020. Statistics also show that over 80% of the city's higher education age cohorts are admitted into higher education. Shanghai participated in PISA 2009 and achieved very high average results.

Meanwhile Hong Kong's primary schoolchildren's performance in reading literacy was elevated from 14th in 2001 to 2nd in 2006 in the international rankings (Mullis et al., 2006). At the secondary school level, PISA measures learning outcomes for 15 year-olds, showing fairly consistent and high results across the three skills tested, including reading.

The process: China success in education

There are successful initiatives attributed to the excellent outcomes in China education system specifically Shanghai and Hong Kong. These are:

i. *Teacher quality and teaching*

The Chinese government has come out with a comprehensive system to upgrade teachers' quality. Since 1997, a state policy has given early admission to student teacher candidates. Hence, "normal" (teacher training) universities enjoy priority admissions and attract better students. Improvement in teacher's salary has led teaching to become a preferred occupation especially in big cities like Shanghai and Beijing. However in other rural areas in Mainland, China where teachers do not receive high salaries, they can compensate it with doing extra class or private tuition. In keeping teachers new skills and knowledge up to date and fostering quality, teachers are encouraged to share their teaching and learning process through "teaching-study groups". A group of teachers teaching the same subject will observe the teaching and learning of their senior teachers. Sometimes, teachers are expected to teach demonstration lessons (called public lessons) for a large number of other teachers to observe and comment upon. Such teaching protocols are present throughout China, from remote villages to prosperous cities.

Shanghai has put efforts to reform examinations that meet the expectations of the curriculum. For example, integrated papers are required that cross- disciplinary boundaries and test students' capacity to apply their knowledge to real-life problems. Another example is the examination questions provide students with information not covered in the syllabuses and so test their abilities in applying what they know beyond the syllabus and textbooks. Multiple-choice questions have been removed from the city's public examinations.

ii. *Curriculum reform*

In order to stay competitive and keeping abreast with the environmental changes, China has reformed their curriculum continuously. The curriculum reform has put student learning at the center stage. This reform has slowly and continuously moved the curriculum away from rote learning and exam orientation.

In Shanghai, the new curriculum has three components: the basic curriculum, which is to be experienced by all students, mainly implemented through compulsory courses; the enriched curriculum, which aims to develop students' potential and is realised mainly through elective courses, and inquiry-based curriculum, which is mainly implemented through extra-curricular activities.

The inquiry-based curriculum requires students to identify research topics based on their experiences. Through independent learning and exploration, students can learn to learn, to think creatively and critically, to participate in social life and to promote social welfare. Since 2008, the new curriculum has been implemented throughout the city. The overhaul of curriculum is supported by changes in teacher education and professional development. Curriculum design and best practices in teaching and learning are shared with other teachers through a web- based platform.

Likewise in Hong Kong, the secondary school curriculum is designed according to what learning experiences students' need. Liberal Studies has introduced a new area of assessment in secondary education in Hong Kong: a learning experience with timetabled slots and no syllabus – only broad topics. Assessment is meant to be flexible.

iii. *Bridging the disparity and inequality gap*

In 1994, Shanghai amended the policy of "Key Schools" where only selected students can attend schools that are equipped with additional facilities and assigned with better

teachers. The aim of the policy is to offer students at primary and junior secondary level to attend their local schools. The introduction of neighborhood attendance has brought students from different abilities to be in the same classroom and this move has caused teachers to enhance their skills in managing students with diverse abilities and different background. Neighborhood attendance has allowed public examinations to be removed at the end of primary schooling, releasing primary teaching from examination pressure. As an immediate result, innovations and creativity now flourish in primary schools. Neighborhood attendance also prepared the school system to face the challenges of migrant children, who became a major national problem in the late 1990s.

Since 2006, all students in Shanghai receiving compulsory education have been exempted from tuition and miscellaneous fees. Since 2007, all students in compulsory education have been provided with free textbooks and exercise books.

There are several strategies in Shanghai that were taken in order to reduce disparity. First, public schools are provided with proper infrastructure and 64% of the junior secondary public schools are classified as Grade A. Secondly is to transfer teachers from urban to rural areas and vice versa. It was often difficult for rural schools to recruit teachers, and they also suffered from high teacher turnover. Meanwhile, young and middle-aged principals and teachers from rural schools were transferred to urban schools. They are expected to return to the rural schools to enrich them with their new urban experiences. The third strategy is to pair off urban districts and rural districts. The authorities exchange and discuss their educational development plans and join hands to deal with problems such as teachers' capacity building. Fourth, the government has commissioned "good" public schools to take over the administration of "weak" ones. Under this programme, the "good" public school appoints its experienced leader (such as the deputy principal) to be the principal of the "weak" school and sends a team of experienced teachers to lead in teaching. And the fifth strategy is a consortium of schools has been established, where strong and weak schools, old and new, public and private are grouped into a consortium or cluster, with one strong school at the core.

iv. *A well-designed preparation prior to education reform*

In Hong Kong starting in 2005, four years before the implementation of the new curriculum, the government organised meticulous activities to prepare schools for the curriculum. A group of six members from every school gathers in a hotel for a whole day retreat. A community leader provides inputs regarding the societal needs and changing

of the environment. These valuable inputs guide the Curriculum Development Institute to draw curriculum guidelines so as to meet the needs of the society and representatives from schools discuss on how to translate the curriculum into implementation.

Lessons from China: Shanghai and Hong Kong

Shanghai and Hong Kong have proven their success in educational attainment at international level i.e PISA and TIMSS. These two metropolitan cities started their education reform almost at the same time. The reform in Shanghai was part of a national undertaking. The reform in Hong Kong was, however, due to specific needs within the local system. Valuable lessons can be learnt from this 'one country two systems'.

Reforming education

Education reform in Shanghai and Hong Kong attempted to break away from focusing too much on examination to modernizing the system: moving from elite to massive popular education, from emphasizing on teaching to emphasizing on learning, from fact memorization to development of learning capacities, and from economic needs to individual needs. However, public examinations have its own value. The question is how examinations and evaluations can be revised to monitor the output of education as a system, as well as ensuring the quality of student learning.

Shanghai and Hong Kong have engaged in comprehensive approaches to education reform. Reforms in the two cities do not concentrate only on certain aspects of education. Students' academic achievements are not separate from the other aspects of their personal development physical, cultural, spiritual, and so on. Extra-curricular experiences, for example, are treated in both systems as an essential element of students' comprehensive learning experiences and holistic development.

Emphasizing instruction for learning

Shanghai and Hong Kong took learning as the core concern in their educational reforms. They understand how the changes in society and the economy affect the function of education. It is noticeable that in both Shanghai and Hong Kong, the attention to learning is due to the future needs of society. Hence, genuine reform in education has to start with an analysis of society and its changes.

Both systems have made tremendous efforts to understand human learning. This includes i) a body of scholars concentrating on the "sciences of learning"; ii) a framework based on learning that shapes the curriculum; iii) professional discussions among educators in the form of debates, seminars, forums, conferences and experiments, where theories of learning are interpreted and translated into grassroots practices; iv) effective methods of dissemination among grassroots teachers; and v) perception management to convince parents and the media of the value of the changes.

Enhancing teacher quality

Realizing that the quality of teachers is crucial to students' achievement, China education system attracts good students to become teachers and lures them with attractive salaries and other incentives. Teachers' capability and competency are encouraged through professional development such as 'teaching-study groups' or sharing of best teaching and learning practices online.

Helping weaker school through partnership

To reduce the disparity among the public schools, "good" public school appoints its experienced leader such as the deputy principal and a team of experienced teachers to manage the administration of "weak" ones. A consortium of schools is established, where strong and weak schools, old and new, public and private are grouped into a consortium or cluster, with one strong school at the core.

Working together with parents and the community

To encourage the education reform, schools need parents to support them. The vibrant cyber-community has added to the tremendous pressures on schools to maintain a high quality of education. In Shanghai, schools and parents have very close relations, to the extent that information flows both ways on cell phones. In Hong Kong, most leading newspapers have education pages that deal on a daily basis with policy debates as well as disputes in schools. Principals and teachers therefore face a constant daily struggle to balance administrative accountability, client accountability and professional accountability. Therefore ideas, suggestions and strategies are welcomed by schools and the education sector to overcome the issues related to education and to fulfill the needs of the society.

• JAPAN •

Japan

An Overview of the Education System

Japanese students have consistently shown impressive performance in PISA results. A challenging environment has a profound effect on Japanese culture. Realizing that the country itself lack of natural resources, the Japanese put a strong emphasis on developing human capital. They placed great value on education and stress on the group and social relation. During the Meiji era 1868 – 1912, the Japanese determined to modernize their country in order to survive in the new world order. In the field of education, the Japanese adopted ideas from the West that they could adapt to the pressing needs of Japan.

Japan has nine years of compulsory education. Financial assistance is provided for those students who needed it, and enables every high school graduate to take the college entrance examinations. Japanese education system has two significant examinations i.e the high school entrance and university entrance examinations. These examinations represent gateways to status in Japanese society.

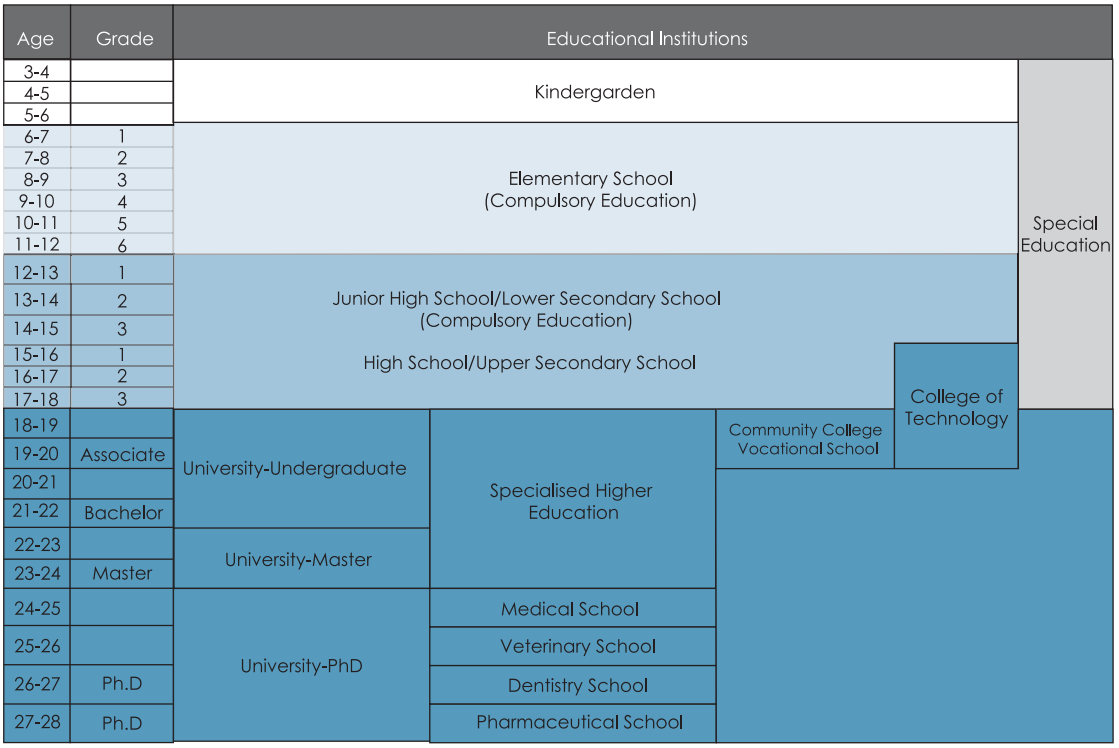


Figure 7.1 Japan education system organization

Previously, only a limited number of special high school graduates had been allowed to take these examinations. This policy drives towards the highly meritocratic system that had already begun.

In Japan the reputation of the school depends on students' examination results and their behavior. Homeroom teacher and especially a mother will be held accountable for the poor student's achievement or violation of laws. Students will strive for excellence not only to uphold their pride but for the group as a whole. The value pervades the workplace. Japanese people work hard largely to earn respect from their colleague. They work hard for the group rather than personal distinction.

The school curriculum in Japan is set by the Ministry of Education, Culture, Sports, Science and Technology and revised every 10 years in order to provide quality education for all from kindergarten to upper-secondary level. It serves as a guideline for teachers to follow but leaves them room for further elaboration. A standardized national curriculum and textbooks, coupled with relatively equal distribution of educational facilities and resources, have helped to achieve fairly egalitarian outcomes with students performing to a high level. Students' family background has less impact on how well they do in school than in many other countries.

The outcomes

Japan has consistently been one of the top performers in PISA. However, the PISA 2003 reading test dropped from 522 points to 498 points, causing a 'PISA shock' that sparked a national debate on education policy. In PISA 2009, Japan's average score in reading was bounced to 520, 529 in mathematics, and 539 in science. Confirming Japan's relatively egalitarian educational outcomes, socioeconomic factors explained 9% of the variation in student performance, lower than an OECD average of 14%.

The proportion of 15-year-old students who said they read fiction for pleasure rose by 14.5 percentage points between 2000 and 2009, the largest recorded increase among OECD countries. Nearly 90% of public lower-secondary schools now organize reading time for all pupils, compared with fewer than half in 1999.

Japan high school graduation rate has reached 93%. In 2009, 56% of Japan's population aged between 25 and 34 had attained tertiary education, compared with an OECD average of 37%.

The process: Japan's success in education

Many policy makers in Japan attributed excellence in PISA results to the curriculum. The focus of the curriculum is mainly in line with the current needs and international standards without compromising the values.

i. *The depth and demands of the curriculum*
Japan has national curriculum standards that define the content to be taught by grade and subject, and every ten years they revise this curriculum. Throughout the country, teachers teach based on the national curriculum standards. The university professors and ministry officers develop the curriculum with the guidance from the Japanese Ministry of Education and advice from the Central Council for Education.

In most Japanese high schools, roughly 70% of total available time was devoted to just five subjects: Japanese, Social Studies, Mathematics, Science, and foreign language (mostly English). The remaining hours were devoted to gym, music, art, homeroom and other elective subjects.

Japanese students spend more time at school, signifying that Japanese students have more time to go into greater depth in these core subjects than in most other countries. They are also very focused on the core subjects in the curriculum because they are not distracted by subsidiary courses. Essential subjects are given plenty of time. Each topic is carefully developed and in great detail.

In Mathematics and Science, the emphasis is on the fundamental underlying concepts, which are presented clearly and straightforwardly. Secondary school students routinely master topics in Mathematics and Science that are beyond those covered by secondary school students in other countries. The curriculum could be characterized as being narrow but very deep.

ii. *Teaching methods: Focus on student engagement*
The class size in Japan is large compared to Western countries. There are 35 to 45 students in a class – and most instruction is for the whole class. Students are not separated into ability groups. The teaching is not fully equipped with instructional technology and instructional aids of other kinds. There is no special class for struggling students and gifted students. Special education student are also assigned to regular

classrooms. How do Japanese teachers manage the large class size and heterogeneous classroom? Teachers meet frequently to share issues on managing students of different ability and sharing best practices in pedagogical methods. Student engagement is their prime target during the teaching and learning process. Students are posed with problems related to the topics or contents of discussion. It is not so much to get the right answers rather the process of coming to a conclusion or attaining the answer that matters most.

iii. *Close school home relationship*

Japanese employs the concept of homeroom teacher. Homeroom teachers spend an hour a day in homeroom. The homeroom becomes that student's family in the school. Japanese homeroom teachers at elementary schools teach all subjects except specialised subjects like music and crafts. These homeroom teachers typically follow their classes through the grades for several years. They are required to regularly visit their students' families. Students often go to their teachers' homes on certain occasions such as teachers' birthdays. In the upper grades, the teachers are expected to provide academic and career and job counselling. The approach is based on the belief that effort and not ability is what primarily explains student achievement.

iv. *Teacher quality*

Teaching is a highly desirable job in Japan. Teacher's pay is comparable to other professions and by law, among the highest paid of Japan's civil servants. To become a teacher, students must attend a ministry-certified teacher education programme at a university or junior college. Japan also has some national teacher training universities with model schools attached to support teacher training for new teachers. Teaching practice is a common part of all teacher education programmes.

The ministry of education provides an induction programme for new teachers that offer a sustained opportunity to apprentice with experienced master teachers before being expected to teach full time. The induction period lasts a full year, and the master teachers are given the year off from their teaching jobs to supervise their apprentices. The law requires teachers to take certain additional training after 10 years of service. Teachers can also apply for paid leave to take masters' degrees at graduate schools. The ministry also offers various training programmes for district trainers at its national centre.

Teacher development is pivotal in Japan. Teacher development occurs on the job. In addition to the central importance of the design of the lesson in Japanese instruction,

"lesson study" in the development of the Japanese teaching profession is also crucial. Lesson study is an approach where teachers prepare their teaching lessons in a group and after finishing the teaching lessons; one of the group members teaches the lesson while others will evaluate the teaching performance. The head teachers supported this lesson study by having organized meetings to discuss teaching techniques. The lesson study strategy has proven to have a profound impact on the practice of teaching.

v. *Rightly Prioritizing Allocation*

The Japanese spent their money wisely in education. Comparing to OECD countries, Japan spent less but get better results. Mostly, money is spent on teachers and instructions. They do not have special and embellish school buildings and cafeteria, their textbooks are smaller than other developed countries and in a paperback format.

vi. *Accountability and assessment*

There are two entrance examinations in Japan namely for enrolling high schools and university. Since Japan is concerned about their quality of students as compared to countries like Korea, Singapore and China, they instituted a national test on every student at the sixth grade and the ninth grade, but they have since decided to administer the test only to a sample of students to monitor the performance of the system. Japanese education system is highly meritocratic so as to meet the employers and society demands. Therefore they put much emphasis on academic achievement and rewards for students' academic success. Teachers and their group are held accountable for their students' success and their reputation rest on their students' achievement. In meeting the employers' requirements, Japanese examinations are designed to find out how much applied intelligence students can demonstrate and the degree to which they can use their intelligence to do something of value.

vii. *Emphasizing on equity and quality*

Classrooms in japan are heterogeneous. Students of different abilities are learning together in the same class. All students are expected to master the depth and breadth of the same content of the curriculum. The system is set up so that high-achieving students can help lower-achieving students within a group, within a classroom and within a school. To reduce the gaps in terms of quality of the school, Japanese teachers and principals are often reassigned to different schools by the prefectures. It is also to make sure that the distribution of the most capable teachers among schools is fair and equitable. Teachers and administrators are transferred regularly every few years so the same people are not in the same schools all of the time.

viii. *Reforming education system and the curriculum for the 21st century*

Responding to the changes in the demand of the society and the dynamic environment in the 21st century, the Ministry of Education has reviewed the education policy, which was previously seemed to be very strict on uniformity, specificity and direction from the top. The "Zest for Living" strategy turned some of the functions of the ministry over to lower levels of government, reduced the number of credits that must be earned from required courses from 38 to 31, reduced the school week from six to five days (though schools are still open on Saturdays for extra-curricular activities and extra school work for those who want it), and reduced the curriculum emphasis on rote learning and memorisation in favour of experimentation, problem finding and problem solving. The reform has also made it possible for the best students to enrol in university early and take college courses in high school.

Schools were given greater discretion over their budgets and personnel. New measures were taken to evaluate teachers, and, especially, to commend and reward excellent teachers while transferring teachers with mediocre track records to non-teaching positions.

The curriculum is now focusing on i) fostering children's ability and quality to find a theme, think, judge and solve a problem on their own; and ii) enable children to think about their own life, urging them to explore subjects with creativity and subjectivity and to solve problems through their own ways of learning and thinking. Integrated study is introduced through experiential learning such as experience in nature, social life experience, observations, experiments, field study and investigation as well as problem-solving learning to learn about cross-sectional, comprehensive subjects like the environment, international understanding, information, health and welfare as well as subjects that interest students.

The Japanese government rewrote the Japanese Fundamental Law of Education, which was passed in 2006. The law is basically based on the first Fundamental Law (of 1947) that had put forward four principles:

- The idea of education in seeking the "accomplishment of character building".
- Equal opportunities of education and equality of the sexes.
- A democratic and single track school system.
- Free, compulsory education under the 6-3 school system (six years of elementary school, three of middle school).

Acknowledging how much had changed, the new law reaffirms that Japanese values remained the same.

Lessons from Japan

Japan has consistently showed a steady achievement at international assessments and a striking balance between academic performance and the values specifically respect for elderly, intolerable of lackadaisical attitudes and abide to the values of the group. There are some elements that can be learnt from the Japanese education system namely:

The culture of valuing education

The Japanese really value education and make full commitment to education. They believe that education is the key to the country's future. Students are supported at home and schools are well resourced. Teachers have high expectations on all students regardless of their ability. Teachers believe that all students can achieve high standards and they work hard to adjust instruction to individual needs.

A focused and coherent curriculum

The Japanese pun much emphasis on the details of the curriculum. The curriculum is coherent, carefully focused on core topics and their deep conceptual exploration, logically sequenced, and set at a very high level of cognitive challenge.

Professional development and quality instruction

Teachers in Japan improve their teaching practices and keeping up with the latest development in teaching and learning through "lesson study". The strategy encourages teachers to share their best practices in dealing with different needs of the students. Feedback from members of the group will flourish the idea of a teacher to improve the lessons.

A moral education for life

Japanese focus on moral education for life. Though there are courses on moral education in primary schools, this agenda extends far beyond them. Even in high schools, where

there are no specific courses on moral education, the national curriculum emphasizes that all activities should take moral education into consideration. To encourage moral education, there is evidence of efforts to reward hard work and persistence, to praise students who take on a challenge, to engage students in serving their school and fellow students and to take responsibility for helping others, to reward modesty and to give others credit for one's own good work. In many different ways, students are taught to respect their elders and their teachers, to do what is right, to be orderly and organized.

Prioritizing allocation

Japan spends less on education compared to other OECD countries, but produce better results in academic performance. They spend more for teachers and promoting instructions and less on buildings and other facilities.

• KOREA •

Korea

An Overview of the Education System

Korea has been developed from one of the poorest and least developed countries after the Korean War to emerge as a developed country due principally to achievement of industrialization and democratization. In addition, Korea successfully joined the OECD, which is called “developed countries’ club”, in 1996. According to domestic and international researchers, economic growth and social development of Korea can be attributed to high participation in education and government’s strong policy interventions to mobilize human resources.

The Basic education system was set by establishing an education philosophy and a statute education law (1949), introducing and extraordinarily expanding compulsory elementary education, institutionalizing the 6-3-3-4 education system, and establishing a modern education process. This is based on both the vision that education is the foundation of a nation, and the provision related to education in the First Constitution during the 1945-1960 periods.

The nation’s education was growing rapidly, and there was a change worth being called an ‘education revolution’. The government placed its efforts in expanding educational opportunities, and people showed their extraordinary passion for education through adult literacy movements and children education. They were focused on the idea that education was the only way to survive during even those times of confusion and poverty. Such efforts and passion continued even through during the war through ‘makeshift schools’ and ‘Wartime College Union’ in Busan.

After the war, in order to restore the destroyed education facilities and quickly reestablish the postponed compulsory elementary education system, the ‘6-year Compulsory Education Completion Plan (1954-1959)’ took off with over 10% of the government budget being invested in education. As a result, universalization of elementary education was achieved with the number of elementary schools in the nation increasing from 2,834 to 4,496 between 1945 and 1960. Secondary and higher education also expanded greatly. The number of middle schools increased from 166 in 1945 to 1,053 in 1960 while high schools went from 342 in 1952 to 640 in 1960.

The adoption of the single-track education system worked profitably in early establishments of compulsory education and equal expansion of education opportunities. The self-governing education system introduced then became the foundation for constructing Korea's present local education administrative system. Immediately after the cease fire, the Ministry of Culture and Education established the '6-Year Compulsory Education Completion Plan (1954- 1959)', trained teachers, built facilities, and made plans for securing finances to achieve a 96% elementary schooling rate in the target year.

The 1960s and 1970s were periods when the universalization of elementary education became complete and secondary education rapidly expanded keeping pace with such industrialization. The No-test Middle School Entrance System (1968) and the High School Equalization Policy (1974) became the crucial turning points. Vocational education and training were largely amplified and systemized following the strategy of industrialism and an economy-first system. Additionally, regulations on private schools were realized with the enactment of the Private School Law (1963), and systems regarding teachers' training and education such as the establishment of the Education Graduate School (1963) were arranged. Education policies also advocated a 'promotion of science technology education' in 1964.

In the 1980s, the focus of education reform turned to college education, and higher education started to rapidly grow. From 1990 till today, the period of globalization, informationalization, and a knowledge- centered society started to bloom. After entering this era, there was an emphasis on education that develops creative and inquisitive minds, high-tech ready for the 21st century, and world-class quality while the May 31st Reform of the Educational System was presented in 1995 finishing the full and complete change of direction for all of Korean education.

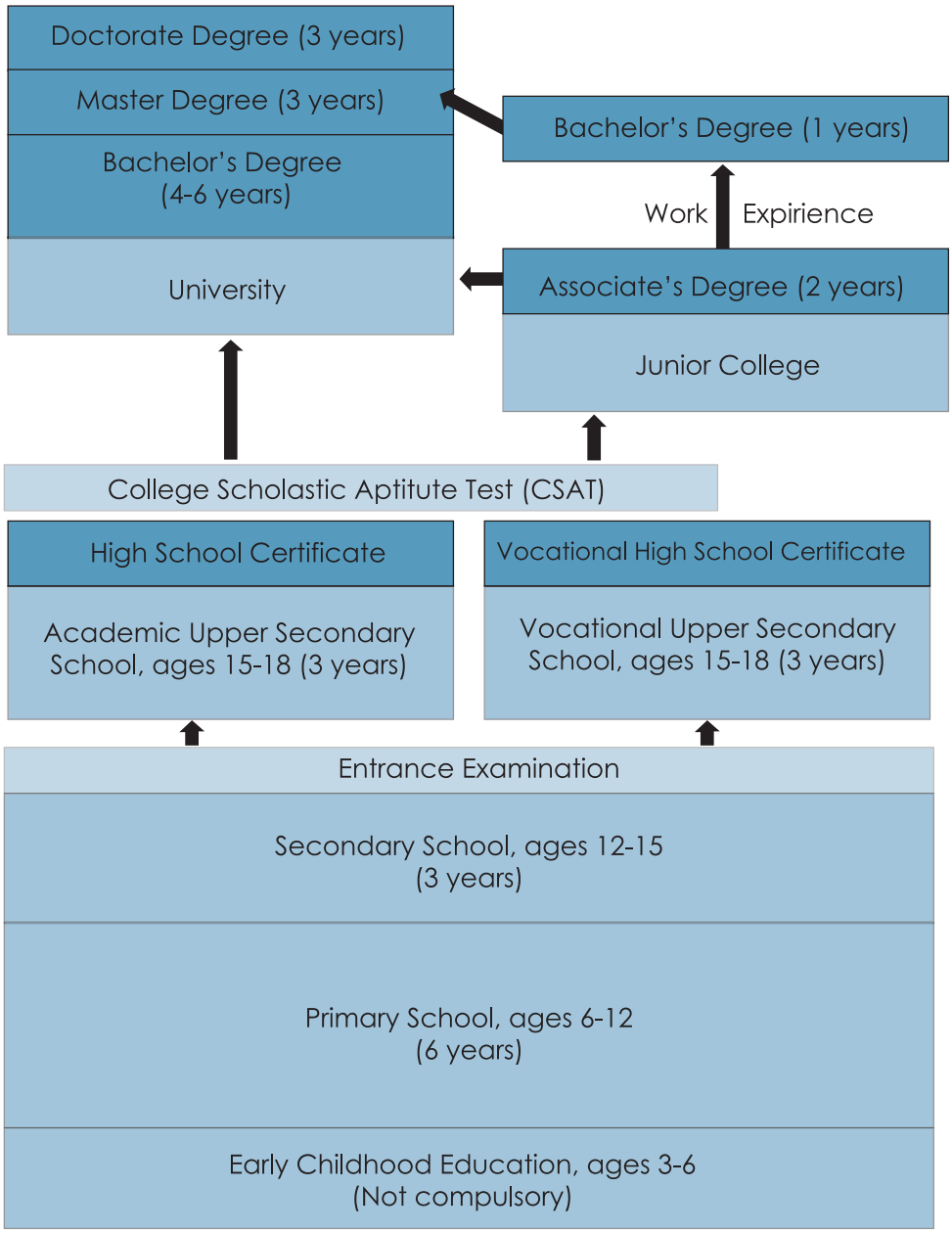


Figure 8.1 Korea education system organization

The outcomes

Korea has shown a tremendous change in education and economy the last fifty years. The education policy and compulsory education has yielded good results. The illiteracy rate of Koreans in 1948 reached 78%, it dramatically dropped to 4.1% in 1958 through a nationwide illiteracy eradication movement.

The schooling rate of Koreans at the end of the Japanese Occupation was only 50.9% for elementary, 3.2% for secondary and 0.18% for higher education. However, Korea then experienced rapid expansions in education throughout all education levels. It started with the expansion of elementary education in the 1950s and continued with the expansion of secondary education in 1960s and 1970s to higher education, which started to grow after the 1980s. With 90% schooling rate, the universalization of elementary schooling was achieved in 1957, middle school in 1980, and high school in 1995. The current schooling rate for higher education is also near the 70% mark. Korea has a comparatively high proportion of 'resilient students', students who do well despite coming from socio-economically disadvantaged family backgrounds: 14% of all students from disadvantaged backgrounds are resilient in Korea, against an OECD average of 8%.

In addition, measured by international academic achievement tests such as PISA and TIMSS, Korean students have been consistently receiving great marks in reading, mathematics, and science. Korea was top among OECD countries in the PISA 2009 reading tests, with 539 points, and top in mathematics with 546 points. It ranked third among OECD countries, after Finland and Japan, in science, with 538 points, and top in a smaller survey of digital reading skills, with 569 points. Korea continued to excel in the PISA 2012.

The process: Korea's success in education

Despite insufficient in natural resources, Korea managed to fully utilize their human capitals in a good way. Emerged from a poor country during the 1950s, Korea has been able to systematically put forth their education development in concomitant with economic policies and initiatives. Even though many elements contributed to the success of education in Korea, there are some that are bold enough that backed the system as one of the best education system in the world.

A well-planned education policy

Korea has consistently established its education policy. The postwar had witnessed the roll out of the Basic Education System and Generalizing Elementary Education in the first phase (1945 – 1960). In this phase, compulsory elementary education had been expanded, the 6-3-3-4 education system had been institutionalized and a modern education process had been established.

In the second phase (1961 – 1980) expansion of secondary education and amplification of vocational skills education and training had been implemented. This was done in an effort to suit the needs of the industrialization era and labor- intensive light industries during that time.

The third phase (1980-Mid-1990s) had seen growth of higher education and pursuit of educational substantiality. The aims in this era were to actualize economic reconstruction and stabilize growth. In the 1980s, the focus of education reform turned to college education, and higher education started to rapidly grow. As the number of baby boom generation high school graduates increased, demands for college entrance rapidly increased. The industrial structures were heightened and the weight of technology-intensive industries grew, the role of higher education became more and more important. The expansion of college quotas started from the late 1970s. When 1980 came, Korea had exceeded the average schooling rate of the entire world, and in 1985, it surpassed the average of all other regions except North America. In this phase qualitative improvement such as reducing number of students per class in the elementary and secondary education was done. To uphold the quality of the development process in education, Research and Development Organizations related to Education were established. Korean Educational Development Institute was established in 1972. The Academy of Korean Studies was opened in 1978 with the purpose of developing national spirit and culture. The Korea Research Foundation was established in 1981 to support scholarship research activities, interchange, and cooperation among colleges and academic organizations. The Korean Council for University Education established in 1982 conducts functions for improving college education's autonomy, diversity, and accountability.

In the 1990s till present the focus is on the enhancement of education reform and education competitive power. In meeting the needs of knowledge-centered society, there was an emphasis on education that develops creative and inquisitive minds, high-

tech ready for the 21st century, and world-class quality. Diversity, specialization, and autonomy in the school system; introduction of the 7th Curriculum centered on students; intensification of research support for college and industry-academia cooperation; advancement of education informationalization; invigoration of life-long education; and full advancement of the National Human Resource Development Network (NHRD) policy represent the education reform.

Since education is closely connected to all areas and parts of a country such as politics, economics, society and culture, the policy of education system in Korea has been meticulously drawn in line with those factors specifically economics.

Promoting excellence through quality teachers

Korea has been successfully attracting high school achievers to join the teaching profession. Competition for admission into national universities of education is so intense that the top 5% of high school graduates are admitted to such universities. Realizing that the quality of the teacher determines the quality of education, the government has painstakingly established the policies to recruit the best people and retain them throughout the system. Selecting the top talents has to be complemented with other elements in the education policies such as compensation, welfare, and promotion.

The attraction of teachers to the profession has close bearing with their legal status and position guarantee. Teachers enjoy a very solid guarantee of employment status so that they may commit themselves to the profession of teaching with a sense of security during their lifetime, as the Public Educational Officials Act (Section 43) and the Private School Act (Section 56) stipulate respect for teacher's authority, guarantee of employment status, and protection against disposition against their will regarding leave or retirement. Teachers are also very well paid. In 2009, a lower-secondary teacher with 15 years' experience earned the equivalent of 195% of Korea's annual GDP per capita, compared with an average of 124% in OECD countries. Apart from that, the government provides a variety of incentives such as additional credits for promotion or accommodation for teachers stationed in rural areas. High school graduates with a desire to teach in their rural areas are entitled to scholarship while they are studying.

To ascertain the quality of the teachers after completing teaching courses in the university or teacher training department, teachers enter the teaching profession as public officials

usually at a young age and have to pass a challenging employment examination. Primary and secondary school teachers are selected and employed by a full open competition called 'Teacher Employment Examination.'

Promotion requires certification of quality and ability in terms of career, work performance, training performance, and extra credits and the Public Education Officials Promotion Regulation provides for highly specific and complex arrangement for calculating points per applicable factor.

To support teachers in sustaining their teaching skills, the government provides a wide variety of training institutions offering in-service training programs for teachers such as central training institutions, training institutions affiliated with colleges or universities of education, and those run or designated by local governments. In addition, online or cyber training programs are available on the Internet in Korea and blended training programs combining classroom training and cyber training are offered in great numbers. Teachers participate in such programs actively.

Providing quality education for all through ICT

Korean authorities were quick to recognize the potential of ICT in education, launching a master plan to develop ICT infrastructure with one PC per teacher and Internet access in all classrooms. Subsequent strategies have set out to enhance education quality by providing open access to content and by training teachers to integrate ICT into classroom teaching.

To reduce inequalities in access to education, and ICT is seen as key to achieving that goal. In 2005, complementing services provided nationwide by Korea's Educational Broadcasting System, the government launched a Cyber Home Learning System that gives students home access to digital tutoring. In 2011, building on pilot projects launched in 2007, it announced a $2.4 billion strategy to digitize the nation's entire school curriculum by 2015.

Another ambitious project, called 'Smart Education', is the implementation of 'digital textbooks' -- interactive versions of traditional textbooks that can be constantly updated in real time. Digital textbooks contain a combination of textbooks, reference books, workbooks, dictionaries and multimedia content such as video clips, animations, and

virtual-reality programmes that can be tailored to students' abilities and interests. Students can underline sections, take notes, reorganise pages and create hyperlinks to online material.

By making access to new learning modes available to all, 'Smart Education' will help to bridge the education divide between families who can afford to pay for private tutoring and those that can't. Pilot tests are said to have shown measurable improvements in the performance of students from less well-off families and students in remote areas.

Aligning curriculum with the modern society

The student-centered 7th Curriculum was adopted into the education process in 1997 and is still operating in the present. The essential contents are the following: Formation of a nationwide universal basic curriculum spanning over 10 years, Introduction of education processes in levels (education processes in step form, deepening and replenishing form, and course selection form), Introduction of education processes centering on choice for high school juniors and seniors, New establishment and expansion of unscheduled time, Reduction of course requirements and optimization of study contents and amounts by course, Building evaluation systems for the education process centering on quality management, Decentralization of education processes and operations through the expansions of roles for districts and individual schools. The 7th Curriculum faithfully reflected education development trends compatible to the demands of modern society.

Lessons from Korea

Korea's tremendous development in nearly every aspect specifically in economic and education within less than half a decade should become a model to other countries. There are numerous factors attributed to Korea's excellent in education that has put the country among the top rank in PISA 2009 and PISA 2012. Among those factors are:

Strong family support

Families contribute a much higher share of the costs of education than in other OECD countries. In 2008, 19% of education costs at primary and secondary level were borne by families, against an OECD average of 7%. At tertiary level, private funds covered nearly 78% of education costs, against an OECD average of 31%.

Hefty investment in education

Korea spends more on education in proportion to the size of its economy than most other countries. In 2008, it invested 7.6% of its gross domestic product in education -- the second highest ratio among OECD countries after Iceland, and well above the OECD average of 5.9%.

Emphasis on private tutoring

Korean children spend less time at school than children in many other OECD countries. However, large numbers take part in private tutoring after school, often until late at night. In 2010, 72.2% of lower-secondary students were estimated to be receiving private tutoring. At the elementary level, the ratio was estimated to be as high as 86.8%.

World class ICT infrastructure

Korea accomplished astonishing results such as world-class infrastructures for education informationalization; world-class sharing systems for education information centered on EDUNET, the education information service; the first ever nation-wide internet base; National Education Information System (NEIS); and more through gradual and comprehensive informationalization policies. Now, education informationalization policies are changing from an ICT Utilizing Education, which partially applies information-communication technology, to e-learning education, which utilizes computers and the Internet and u-learning (u: ubiquitous). This means upgrading to high-tech technology where the utilization of information-communication technology is possible anywhere, anytime.

• MALAYSIA: A WAY FORWARD •

Learning from excellent education systems: Moving Forward.

Every education system has its own way of achieving common goals and sustaining their performance and excellence. As mentioned in the introduction of the first chapter, dimensions that reflect the excellence of education system as specified by OECD are almost all of their students are in high school at the appropriate age, average performance is high, being at the top rank in the Programme for International Student Assessment (PISA), (with respect to their mastery of the kinds of complex knowledge and skills needed in advanced economies as well as their ability to apply that knowledge and those skills to problems with which they are not familiar); students do well regardless of their socio-economic background; and spending for education is less than OECD average but yield good results. High performance system is delicate, since it encompasses various elements that entangle together political, economic, social and culture of the respective country. In improving education system, numerous aspects must be considered. To simply adopt some elements that are believed to be factors that contributed to the excellence of education system, will leave the country stray from their intended aims and waste of human resources.

Reviewing the education system in the selected countries specifically Finland, Singapore, Canada, Germany, China (Shanghai and Hong Kong), Japan and Korea in previous chapters, describes that there are distinctly common elements that have been the recipe for their success in gaining and sustaining their excellent education system. Nevertheless each country has meticulously personalized some initiatives and the processes in the education system to their respective society and culture. There are several common aspects in those countries that considered being the critical success factors in developing an excellent education system. Among the success factors that can be benchmarked from the selected countries are:

i. A strong political will

There is a strong evidence of education system that consistently yield respectable results and goes beyond providing basic education. Strong political will seems to plays a major role in steering its own country towards achieving targeted goals thus propelling

the become relevant with the environmental changes and meeting the demand of the society. Finland for example had a dream of a common public school for all Finnish children. It was particularly important to secure access to good education in rural parts of Finland that were suffering from rapid migration to urban centers and to Sweden. Consensus among the major political party in 1963 to materialize a common public school or peruskoulu, is critically important in order to improve the old-fashioned education system existing at that time. Equality, efficiency and solidarity, the essential principles of these three political ideals, merge into a consensus that enriched each other, thus prepare a solid ground for Finnish education policy. Establishment of education policy and the strong support from the politicians of both sides for the common good has significantly improved the equality and quality of the education system as a whole.

Singapore has revealed well-planned strategies, which are in accordance with their vision to become a developed nation. Realizing that the country is lack of natural and other resources, the government strongly emphasizes on developing human capital. Education has become a prime engine to mobilize the country towards their goal. An integrated system of planning where the critical manpower needs and future skills are fed to the education sector so as to prepare their human potential with the right skills in meeting current demands and challenges. The ministry of Education and the institutions of higher and post-secondary education then use these skill projections to inform their own education planning, especially for universities, polytechnics and technical institutes.

Canadian leadership has shown undivided support and perseverance regarding quality education by keeping focused on the student achievement agenda. The Ministry of Education focuses on increasing literacy and numeracy in elementary schools, and increasing the high school graduation rate. To strengthen the initiatives in achieving students' achievement, the ministry put much emphasis on capacity building approach and highlighting on struggling schools. These schools would receive additional support and outside expertise rather than be punished or closed. Support was given to schools in terms of additional fund to hire Student Success teacher. A special programme for students who do not have the ability to engage in traditional academic curriculum is provided. These students will have a different menu of courses. Some provinces for example British Columbia, provides fund for additional language support to the immigrant students so as to not deprive and leave them behind and increase the gap of the achievements between native speakers and the immigrant students.

The German government has demonstrated a strong commitment concerning education by providing free public basic education to all and Germany was the first to develop the modern research university. This modern research university attracts secondary students from the Gymnasium. Germany has a right approach by having a tripartite system which provides students with choices that suit their needs and ability. Students are channeled as early as the age of ten by some states, to acquire technical skills or humanities that prepare them to join civil service or the teaching profession.

The government has embarked on the right move to have secondary students doing their apprenticeship while still in vocational education. This dual system prepares students with high technical skills as required by the employer and establishes Germany as an industrialized country. To enhance the performance of the students, Germany emphasizes on acquiring German language at kindergarten level. This effort is hoped to increase language proficiency between native speakers and children whose family does not speak German at home. The PISA and data analysis showed that the standards of students were in fact low and highly variable. The government responded promptly by reviewing and standardizing their curriculum, monitoring teaching and learning process and establishing research and development and benchmarking other countries.

China has made a tremendous progress and achievement after the Cultural Revolution ended in 1976. Teachers and teaching have become a prime aim for the government to improve the education quality. In the major cities such as Beijing and Shanghai teaching has become the profession of choice. The government continues to improve the quality of education by developing the Outline for Medium and Long-term Development and Reform of Education up to 2020, which aimed to improve education in the next decade. One of the objectives is to introduce universal pre-school education. Education is seen as a dynamic tool to mobilize economic and social development. Hence, the government focuses on moving away from rote learning and regurgitates information on the test paper to increase students' participation in learning activity, promote communication skills and focus on critical thinking and problem solving.

The government's effort to promote quality through education reform is not only reflected in the Mainland but in Hong Kong as well. Hong Kong developed a comprehensive reform discourse in 1999. This was due to dissatisfactions among parents, teachers, employers and the society as a whole pertaining to the standard of education particularly when comparing public schools to international schools.

Japan systematically prepares their human resource as a result of challenging environment and lacking in natural resources. The government put much emphasis on providing quality education from as early as the Meiji era 1868 – 1912. The Japanese adopted ideas from the West that they could adapt to the pressing needs of Japan. The government rightly spent money on teachers and instruction. Teacher development and the depth of the curriculum have become the prime agenda by the ministry of education. The ministry will conduct a curriculum review every ten years to keep abreast with the development and society needs.

The Korean government has shown a strong commitment towards education by placing its efforts in expanding educational opportunities. A well-planned education policy has been done in four stages since post war until present. An elementary and secondary education had been expanded, the 6-3-3-4 education system had been institutionalized, vocational skills education and training had been implemented and a modern education process has been established specifically emphasizing on the curriculum of the 21st century skills which focusing on creativity and innovation and leveraging technology in education as a means to bridge the gap between families who can afford to pay for private tutoring and those who can't.

A strong political will is evident in the Ministry of Education Malaysia. Realizing the results of the PISA 2009 and 2012 were not encouraging, a long-term strategies planning has been developed and comprehensive initiatives have been systematically spelled out in the Malaysia Education Blueprint (2013 – 2025). The main aim of the blueprint is to achieve two main aspirations namely system and students' aspirations. There are numerous underlying initiatives in achieving these two main aspirations and the journey towards achieving the PISA results and standing tall with other excellent education systems. Unless there is a strong commitment and political will of the policy makers and consistency in delivering policies, the quality of education and achieving good international assessment results remain a challenge.

ii. Selection and training of quality teachers

Training quality teachers is the most pertinent process in any education system in the world. As the front liners who are trusted by the stakeholders to deliver the pedagogy and curriculum that is relevant and recent, issues regarding their quality are intolerable.

Finland has proven that quality teachers bring rewarding outcome. The country had challenged the old segregated education system to a comprehensive school where every child regardless of their background and ability, learn together in the same classroom. Finland has become a benchmark when the country emerged at the top rank in the PISA results in the year 2000. Since then the country has consistently been almost at the top rank. Quality teachers are presumed to play a major role in the outcome of the PISA results. Generally, preparing quality teachers involves two key prerequisites. First is selection of the teacher student. Secondly are curriculum of the teacher education and quality of the training provider. Teachers in Finland are selected from the best among general upper-secondary school graduates. These teacher students will undergo a broad-based teacher education curriculum that prepares Finnish teachers to possess well-balanced knowledge and skills in both theory and practice.

Teacher education in Finland put great emphasis on research. It integrates educational theories, research methodologies, and practice. To ensure the quality of teacher, the training programs forge close collaboration between subject faculties and schools of education. This collaboration is to determine the flow and sharing of current knowledge and information from the expert in content subject to student teacher. Proper guidance from the expert is highly needed to ensure both solid mastery of subjects to be taught and state-of-the-art pedagogical competencies for all graduates. It is clear that the Finnish education system has put the selection process and teacher education at the top of their agenda so as to gain quality and sustainability in education.

Singapore selected their prospective teachers from the top one-third of the secondary school graduating class. After graduating from National Institute of Education (NIE) at Nanyang Technological University, all new teachers at schools are mentored for the first few years. This step is taken to ensure pedagogical and content that has been emphasized during the training are applied well in the classroom. To attract students to join the teaching profession, teachers' salary is seen as equally attractive as other occupations for new graduates.

The quality of teachers is sustained through professional development. Teachers are entitled to 100 hours of professional development per year. Most of the content includes teaching-based problems in school. Singapore gives priority on developing potential school leaders as well. Young teachers are continuously assessed for their leadership potential and given opportunities to demonstrate and learn, then being promoted to head of department at a relatively young age.

Most of the successful education systems in the world select the best candidates to become teachers. Canada continues to draw its candidates from the top third of secondary school graduates, signifying that the government had a solid basis for believing that its trust would pay off. Acknowledging that the successful of a school is a function of leadership, one of the excellent provinces, Ontario has paid special attention to leadership development, especially for school principals. A mentoring programme has been implemented to enhance skills, knowledge and attributes of principals and vice-principals in order to promote school effectiveness.

Germany selects the top third of secondary schools students to join the teaching profession. Their student teachers will take two major subjects as what other university students majoring in those subjects. This initiative is hoped to improve teacher quality and produce an unusually high level of subject matter knowledge in these future teachers. The quality of teachers is further regulating by having a two-year programme of combined supervised teaching and related course work before they could enter the workforce. They had at least an additional year of mentoring and close supervision, as well as another examination, before they are allowed to assume the role of a full professional teacher.

China education system as well attracts good students to become teachers and lures them with attractive salaries and other incentives. To uplift teachers' capability and competency, professional development is encouraged through 'teaching-study groups' or sharing of best teaching and learning practices online.

In Japan, teaching is a highly desirable job. Teachers' salary is comparable to other professions. To safeguard the quality of teachers, an induction programme is introduced to new teachers. The induction period lasts a full year, and the master teachers are given the year off from their teaching jobs to supervise their apprentices. The law requires teachers to take certain additional training after 10 years of service.

Korea picks the best secondary students to become teachers. To ascertain the quality of the teachers after completing teaching courses in the university or teacher training department, teachers enter the teaching profession as public officials usually at a young age and have to pass a challenging employment examination. Primary and secondary school teachers are selected and employed by a full open competition called 'Teacher Employment Examination.'

The Ministry of Education Malaysia is seriously putting teacher selection as a pertinent strategy in gaining quality teacher. The minimum requirements for the Bachelor of Education (PISMP) for primary school is 5As. Eligible student teacher candidates have to go through a rigorous and stringent entrance test (UKCG) prior to the PISMP programme. The priority to select good students in the national examinations leads to fundamental shift in the profile of teacher trainees.

iii. A sound pedagogical approach

One of the significant elements that frequently contributed to the excellent education system is a sound pedagogical approach. A comprehensive teaching and learning approach is a cumulative skill, knowledge and attitude of the teacher student training. The main aim of teaching and learning is student engagement. In Finland, teachers emphasize on learning development rather than teaching students for grades. Teachers spent more time on curriculum planning, professional development and engage in school improvement. They continually improve the curriculum and teaching methods based on students' achievement. As a consequence every student regardless of their ability has the opportunity to learn together in the same class.

Singapore puts a strong focus on mathematics, science and technical subjects. To make the students better understand on mathematics, teachers make extensive use of visual aids and visualization. The use of this "Model Method" is based on an understanding of how children learn mathematics. Teachers cover less material than in any other countries but deal with it in depth. In teaching science, teachers use inquiry process through three domains i.e knowledge, skills and attitude.

Shanghai and Hong Kong highlight instruction for learning. Both systems have made tremendous efforts to understand human learning. The process of delivering good instruction starts from concentrating on the "sciences of learning", developing a framework based on learning that shapes the curriculum, having professional discussions among educators in the form of debates, seminars, forums, conferences and experiments, where theories of learning are interpreted and translated into grassroots practices, employing effective methods of dissemination among grassroots teachers and dealing with perception management to convince parents and the media of the value of the changes. The teachers' quest for delivering good pedagogical methods is reflected through their perseverance in having a consistent and systematic professional development.

Students in Japan are not showered with the latest instructional technology and instructional aids of other kinds. Their classroom consists of 35 to 45 students.

There is no special class for struggling students and gifted students. Special education student are also assigned to regular classrooms. Teachers are very much concern on students engagement. They meet frequently to share issues on managing students of different ability and sharing best practices in pedagogical methods. Students are posed with problems related to the topics or contents of discussion. It is not so much to get the correct answers rather it is the process of coming to a conclusion or attaining the answer that matters most. Japanese teachers embrace the concept of applied intelligence. Teaching and learning continuously connect between the depth of the curriculum and everyday life.

To improve student's learning, Malaysia puts much emphasis on the teacher professional development. The results from Malaysia's participation in the Teaching and Learning International Survey (TALIS) suggest that participation in professional development activities has been very good. Over 90% of teachers report that they spend approximately 10 days each year on professional development, which is more than the Ministry mandated requirement of seven days per year. Teachers are encouraged and stressed to enhance thinking skills among the students through various pedagogical methods. Ministry of Education has a sound support from Malaysia Digital Economy Corporation Sdn Bhd (MDeC) to promote computational thinking and coding among Malaysian students. These thinking tools are believed to propel higher order thinking skills and to develop skills in software applications development among the students. The challenge to the ministry of education is to sustain the momentum of learning culture among the teachers. Teachers in the 21st century must see themselves as a life-long learner, as an expert who does not have to be told everything to do regarding teaching and learning and must act as a professional problem solver concerning students' learning.

iv. A deep and comprehensive curriculum

A deep and comprehensive curriculum serves as a strong basis in most of the excellent education system in the world. Most countries associate the school curriculum with the vision of the country and the future needs of the nation. Their curriculums are often flexible, dynamic and relevant so as to serve the purpose of the country. In Finland, curriculum is developed by the teachers to suit the needs of the students. They have

been given the full range of professional autonomy to practice what they have been educated to do; to plan, teach, diagnose, execute and evaluate.

Singapore has moved from the curriculum and pedagogical approach that need students to regurgitate information to a curriculum that is in line with the 21st century skills. Serious attention to curriculum development has produced strong programmes in mathematics, science, technical education and languages. To support their educational vision "Thinking Schools, Learning Nation", the curricula and assessment changes have put greater emphasis on project work and creative thinking. A major resource commitment, involving three successive master plans, was made to information and communication technology (ICT) as an enabler of new kinds of self-directed and collaborative learning.
Curriculum development in Canada is provincial based. In some provinces, these curricula are fairly detailed, whereas in others they serve more as guidelines of what should be learned and when. The contents of the curriculum are established through a process of extensive consultation with groups of teachers and subject matter experts.
Germany improved their international ranking in PISA and quality in education by having common curriculum frameworks and common performance standards. Common standards are developed from grade 4 in primary school in German and mathematics. This approach has been expanded to lower secondary and upper secondary school. These performance standards describe in some subject-specific competencies that students are expected to meet throughout Germany. They emphasize the kind of skills and competencies measured by the PISA assessments where appropriate.

China has reviewed and reformed their curriculum continuously to meet the dynamic changes of the environment. China has moved away from stressing on rote learning and emphasizing on examinations to students' learning. The new comprehensive curriculum consists of three components; basic curriculum, enriched curriculum and inquiry-based curriculum. The inquiry-based curriculum requires students to identify research topics based on their experiences. This approach is mainly to encourage and enhance students' critical thinking and problem solving. Since 2008, the new curriculum has been implemented throughout Shanghai. The overhaul of curriculum is supported by changes in teacher education and professional development. Curriculum design and best practices in teaching and learning are shared with other teachers through a web-based platform. Likewise in Hong Kong, the secondary school curriculum is designed according to what learning experiences students' need.

Japan national curriculum is set by the Ministry of Education, Culture, Sports, Science and Technology and revised every 10 years in order to provide quality education for all. University professors meticulously develop the curriculum with the guidance from the ministry and advice from the Central Council for Education. Throughout the country, teachers teach based on the national curriculum standards. In most Japanese high schools, roughly 70% of total available time was devoted to five subjects: Japanese, social studies, mathematics, science, and foreign language (mostly English). The remaining hours were devoted to gym, music, art, homeroom and other elective subjects. In mathematics and science, the emphasis throughout is on the fundamental underlying concepts, which are presented clearly and straightforwardly. The curriculum could be characterized as being narrow but very deep.

Like any other excellent education systems around the world, Korea puts priority on student-centered curriculum as well. The curriculum faithfully reflects education development trends compatible to the demands of modern society.

The Ministry of Education has strengthened the quality of Science, Technology, Engineering and Mathematics (STEM) education. The language policy has been updated to promote proficiency in at least Bahasa Melayu and English language as well as supporting the teaching of Mandarin and Tamil in National Type schools. The ministry has also defined a set of skills and competencies that are aligned with the National Education Philosophy and will provide Malaysian students an internationally competitive advantage.

Conclusion

Countries with excellent education systems around the world share many things in common to stay competitive and sustain their superiority. Their leaders perceive education as bedrock that linked with other elements specifically economy, social and politics. Henceforth, they develop human capital that caters to the needs of the country and prepare their nation with the right skills and knowledge. Predicted future skills are shared and weaved into the education policy and system. Closing the achievement gaps by highlighting on struggling schools has become their major initiative in order to preserve the socioeconomic stability. The government's vision and aspirations are translated into the education policy where the most pertinent aspect is given a priority namely teacher quality.

Every excellent education system around the world selects among the best student to become teachers. Teachers are well trained and they perceived themselves as an expert in their respective areas. Teachers in these countries are well paid and their salary is comparable to other professions. With excellent teachers come sound pedagogical approaches. They continually promote students' learning and students' engagement through various methods. To tailor their teaching to diverse ability of the students, they develop a culture of learning and spend more time on professional development.

Most countries develop their curriculum so as to meet future challenges and needs of their respective nations. The successful PISA ranking of countries highlighted in this book suggests that these nation states focus on holistic education and thinking skills among their students. These are embedded within the school curriculum especially in Mathematics and Science. Apart from this, careful selection of teachers and preparing them with the right skills and knowledge plays a vital role in nurturing the culture of learning and development which are contemporary and relevant in the 21st century.

In reaching to this stage where a country can stand tall with other excellent education systems, endless efforts must be given to develop teachers' capacity as well as school leaders so as to deepen their professional knowledge, skills and values. It is thus timely for policy makers to explore these best practices among the world best education systems and organisation. The aim of becoming an excellent education system remains a challenge until localised solutions and personalised strategies to solve issues in education are initiated by all, either at the higher administrative policy making and planning level or at the fundamental school systems.

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"Best Practices of Excellent Education Systems; A Way Forward is a special book by Dr Rusmini binti Ku Ahmad, the Director of Research, Development and Innovation Centre in the Institute of Teacher Education, Malaysia. Her interests in Malaysian education system have led her into writing this book which compares countries like Finland, Singapore and China with Malaysia in a broader context of education. The aim of this book is to review some of the best practices high performing education systems based on Programme for International Student Assessment (PISA) rankings. This book is written in a way that is easy for Malaysian readers to compare and contrast these education systems for the betterment of Malaysian education system. It should be read by all those involved in Malaysian education."

Norhannan Ramli, Ph.D
Institute of Teacher Education
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"A fast and inspiring read that should be required reading for anyone who deals with basic structure and foundations to good education policies. It makes the reader pause, gasp, and wonder. Highly recommended!"

Siti Salina Mustakim, Ph.D
National Institute of Educational
Leadership and Management (IAB)
Ministry of Education
MALAYSIA

"This book is an excellent book for educators in Malaysia as it reviewed some of the best performing education systems around the world based on the Organization for Economic Cooperation and Development (OECD) report and seven high achievers of PISA such as Singapore, China, Japan, Korea, Finland, Canada and Germany, It shares some of the best practices and planning of successful education policies, and how Malaysian educators, teachers and policy makers could transform Malaysian education system into a world class standard. A must read to all educators, academicians, leaders and policy makers within the education world."

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