Readings on the Chinese Education System

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Shanghai-China Overview

When Deng Xiaoping took power in China not long after the death of Mao Zedong, he inherited a country whose economy and education system had both been destroyed by the preceding government. Deng, concluding that there would probably not be another world war in the foreseeable future, decided to concentrate his energies on economic growth. Declaring that, "To get rich is glorious," he began an era of radical economic experimentation by introducing many elements of a market economy in Guangdong Province in the Pearl River Delta in southern China, and opening up China to direct foreign investment from all over the world. Neither he nor China ever looked back. Within a few years, the coastal provinces of China became the "workshop of the world," experiencing explosive economic growth. China as a whole has been experiencing growth of 9-10% per year ever since. The speed and scale of these developments is probably without precedent in the history of the world.
In an effort to cleanse the country of the influence of the bourgeoisie, Mao had closed the schools and universities and sent educated people of all descriptions to the countryside to be "re-educated." But Deng understood that his economic vision could not be realized by an uneducated workforce. From the beginning, he strongly emphasized the importance of making China as competitive from the standpoint of education achievement as he wanted it to be in economic terms.

Though its education system had been devastated by the Cultural Revolution, China was not without educational resources. Perhaps the most important of these resources was a deep and widely shared belief among the Chinese in the importance of education and their conviction that effort, not inherited intelligence, is the key to educational success.

For more than a millennium, advancement in Chinese society meant joining the military or the government bureaucracy. The key to both was getting high scores on exams that all were eligible to take. The Emperor himself was the chief examiner. These exams were given in the arena of what we would today think of as the liberal arts: poetry, literature and so on. Success entailed rote mastery of a great deal of material, much of it very abstruse. But, at least in theory, a poor farmer's son stood as good a chance of success as the offspring of a feudal lord, if only he put in enough effort. Century in and century out, folk tales accumulated of young people who had emerged from poor and obscure lives into the sunlight of material and social success by making the nearly superhuman effort needed to succeed on the exams.

In Chinese society then and now, social safety nets were thin and porous. Families looked to their children to support them in their old age. And "family" included the whole extended family. Thus the whole family got behind the student in his effort to succeed on the exams, and the whole family suffered if the student failed. Little wonder that, in this society, teachers were highly valued and students were

willing to put in a lot of both time and effort into their education, and teaching became an occupation with high status in the society.

After Deng took over in China in the late 70s, the nation set out to reach parity with the West in education at every level, a truly daunting goal, given the very high rates of illiteracy in China, the extent of the prior destruction of its education infrastructure and teaching force and the depth of poverty in this very rural nation. Professors and teachers began to return from their exile in the rural communities to which they had been sent. Schools and universities reopened. Deng sent many in the government to be educated in the West. By 2006, as many as 80% of China's top leadership had been educated there.

China's first objective was to reduce illiteracy in the adult population and improve enrollment rates in the primary schools on a scale that was unimaginable for most of the nations of the world, goals that it achieved in a remarkably short time. At the higher education level, Deng set a goal of creating 100 research universities in China. Later, his protégé, Jiang Zemin, would set a goal of having a substantial fraction of this number be world class.

In 1986, China passed a law requiring nine years of compulsory education. By the late 1990s, this goal was achieved. By 1997, the government had stopped assigning graduates to careers. In 1999, the government required universities to expand enrollment by 50% by 2000, making it possible for many adults to get the university education they had missed in the Cultural Revolution. They mandated an additional 25% expansion in 2000 and a 22% expansion in 2001. By 2009, 99.4% of students were enrolled in primary education; 99% enrolled in junior secondary education; 79.2% at the senior secondary level; and 24% in higher education.

Now, enrollment in primary school is universal, as is enrollment in lower secondary school. Upper secondary schools, combining the figures for academic and vocational education, now enroll about 80% of the cohort.

To achieve these goals, the Chinese needed teachers. Many of the well-educated young people who had been sent from the cities to the rural areas during the Cultural Revolution had become teachers in rural schools, though they had no training. The post-Mao government sent many of them to teachers colleges for formal instruction in teaching and many returned to the cities to teach. The government attracted many more by offering priority admissions in its universities to prospective teachers. Though teachers' pay is not high, it is rising and teachers have several ways of supplementing their incomes.

Normal class size in China is 50 students, though it can range to as many as 100 students, though class sizes are rapidly declining due to China's one-child policy. Teachers work in subject-based "teaching-study" groups every day to develop lessons and improve instruction. Many hours go into the preparation of a single lesson. Other teachers, principals and district education officers will observe the way individual teachers implement the crafted lessons. The profession is divided into four grades or levels, and the teachers in the upper levels have major responsibility for leading the lesson development process, demonstrating effective lessons and bringing along teachers who are not as advanced as they are.

Once the Chinese government was on its way toward achieving its quantitative goals in the education arena, it began to turn to issues of quality. In the schools, during much of the period following the accession of the Communists to power, a system of "key schools" had developed that became a source of

strength for the system. These were schools in which the state invested considerably more than in the regular state schools and which were therefore able to attract excellent teachers and provide top-notch facilities. When Deng came to power, these schools became laboratories and models for other schools in China, creating a system for the development and spread of superior methods and curriculum. Today, most of the students who attend Chinese universities come from key secondary schools.

For many Chinese, access to university education is synonymous with access to success in life. The universities are graded by the Ministry of Education. Much of one's success depends on which university one gets into, and, within the university, which program one gets into. And that depends, with very few exceptions, solely on one's score on the entrance exams. The score on the mathematics exam counts for not less than 25% of the total score, wherever one wants to go and whatever one plans to study. The result is that Chinese students put an enormous effort into studying and, in particular, into the study of mathematics. The amount of time that a typical university-bound secondary school student puts into studying may be as much as twice that of an American student of the same age.

These features of the Chinese system—the ancient belief that education is the only path to success, the conviction that it is effort and not genes that determines success in education, the meritocratic nature of the Chinese education system, the very high priority accorded education by the post-Mao government of China, the care with which lessons are constructed, the fact that teachers' work is not private but is the object of continual professional observation and critique, the determination of the Chinese people to match western educational benchmarks, the enormous efforts made by Chinese students and the amount of time they put into studying, the emphasis in Chinese education on the study of mathematics—would all lead the observer to expect the Chinese to do well in international comparisons of student achievement. But few expected what actually happened when Shanghai participated for the first time in the PISA rankings: Shanghai topped all of the other entrants in the 2009 PISA league tables.

In China, the four largest cities have the governmental status of provinces. One of these cities is Shanghai. While Beijing is the political capital of China, Shanghai is its business capital and its most international city. It has long had a very special status in China, and has long enjoyed the right to take its own path in certain arenas of public policy when other cities and provinces have had to follow the policies set by the national government in Beijing. This has been true in education.

Shanghai is China's largest city, with a population of over 20 million people, and one of the largest cities in the world. It accounts for only 1% of China's population and 0.6% of its land area, but it produces one-eighth of China's income. It is important to remember that Shanghai is not typical of China as a whole, but just as important to keep in mind that China is a country that is extremely pragmatic, and makes a practice of experimenting carefully and then rapidly spreading what works through the entire nation. One would expect other coastal provinces to be not far behind Shanghai and interior provinces to learn quickly from their coastal peers.

In 1985, Shanghai won for itself the right to set its own exams for entrance into its higher education institutions. This led to a crucial element in the Shanghai reforms, major changes in the exams and therefore the curriculum from a heavy emphasis on memorization and rote learning to an emphasis on the ability to use what one has learned to solve real-world problems, on cross-disciplinary studies and on the ability to solve problems of a kind that one has not seen before, drawing on a deep understanding of what one has studied.

In 1988, Shanghai allowed its students more choice in what had previously been a highly prescribed curriculum. That was followed in 1998 by integrating the sciences with the humanities and by a greater emphasis on active inquiry in the learning process. These changes produced a curriculum balanced between a core curriculum that is the same for all students, an enriched curriculum that permits students to choose their own electives and an inquiry-based curriculum, which is implemented mainly in extra-curricular activities. Overall, the heart of the curriculum has moved from the acquisition of knowledge to the development of student capacity to acquire and effectively use knowledge over time.

Over the last two decades, Shanghai has worked hard to improve teachers' capacities, too, steadily raising the level of education required to teach in the schools. Many teachers now have master's degrees. Every teacher is expected to get at least 240 hours of professional development every five years. A web site was created to provide a wide range of support services to teachers. Under the slogan, "return class time to students," teachers have been encouraged to lecture less and stimulate active student engagement more. Another slogan states that "to every question there should be more than a single answer," suggesting that the teacher may not have all the answers and the student responses to questions other than those the teacher envisioned may have real value. Videos have been made and widely distributed that illustrate teaching methods that facilitate this shift in teaching style.

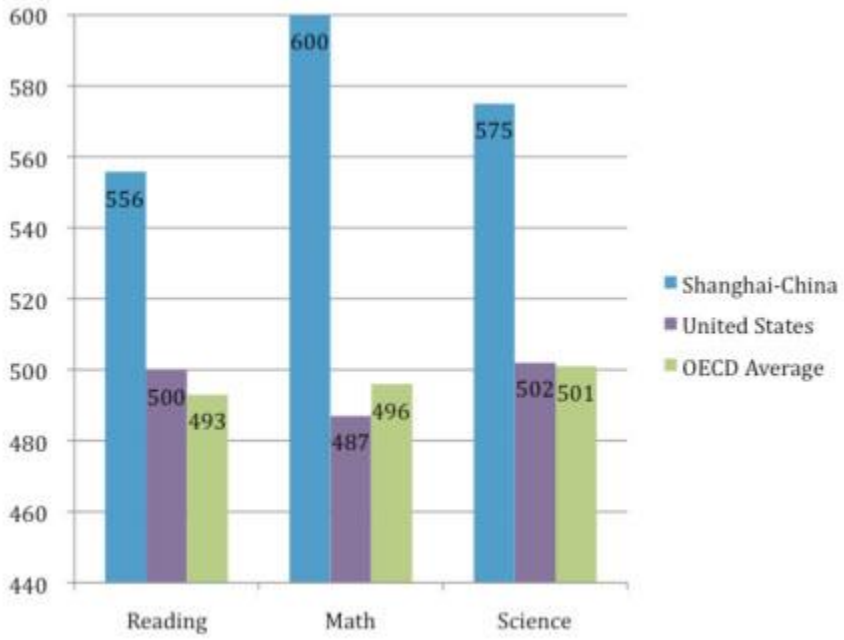
Shanghai has been a national leader in dealing with the problem of migrant children. In China, the right to receive a wide variety of government services is restricted to the residents of the province providing those services. But approximately one out of every five people in China are migrants, typically rural people who have left the impoverished countryside to find work in the booming cities. Because, until recently, they did not have the right to send their children to schools in the province in which they find work, they had to take some of what little they earned to pay for expensive, but low quality private schooling. The Shanghai government, recognizing the contribution that migrant workers have made to the city, have been working to find ways to provide not only places, but a quality education for the migrants in their education system.

DEMOGRAPHIC AND ECONOMIC INDICATORS

The World Economic Forum Global Competitiveness Rank 2012	29
INSEAD Global Innovation Rank 2012	34
Population	1,343,239,923
Languages	Chinese
Ethnic Makeup	Han Chinese 91.5%, Other 8.5%
GDP	7.298 trillion
GDP Per Capita	8,500
Origin of GDP	Agriculture 10.1% Industry 46.8% Services 43.1%
Unemployment	6.5%
Secondary School Completion	18
Tertiary Completion	5

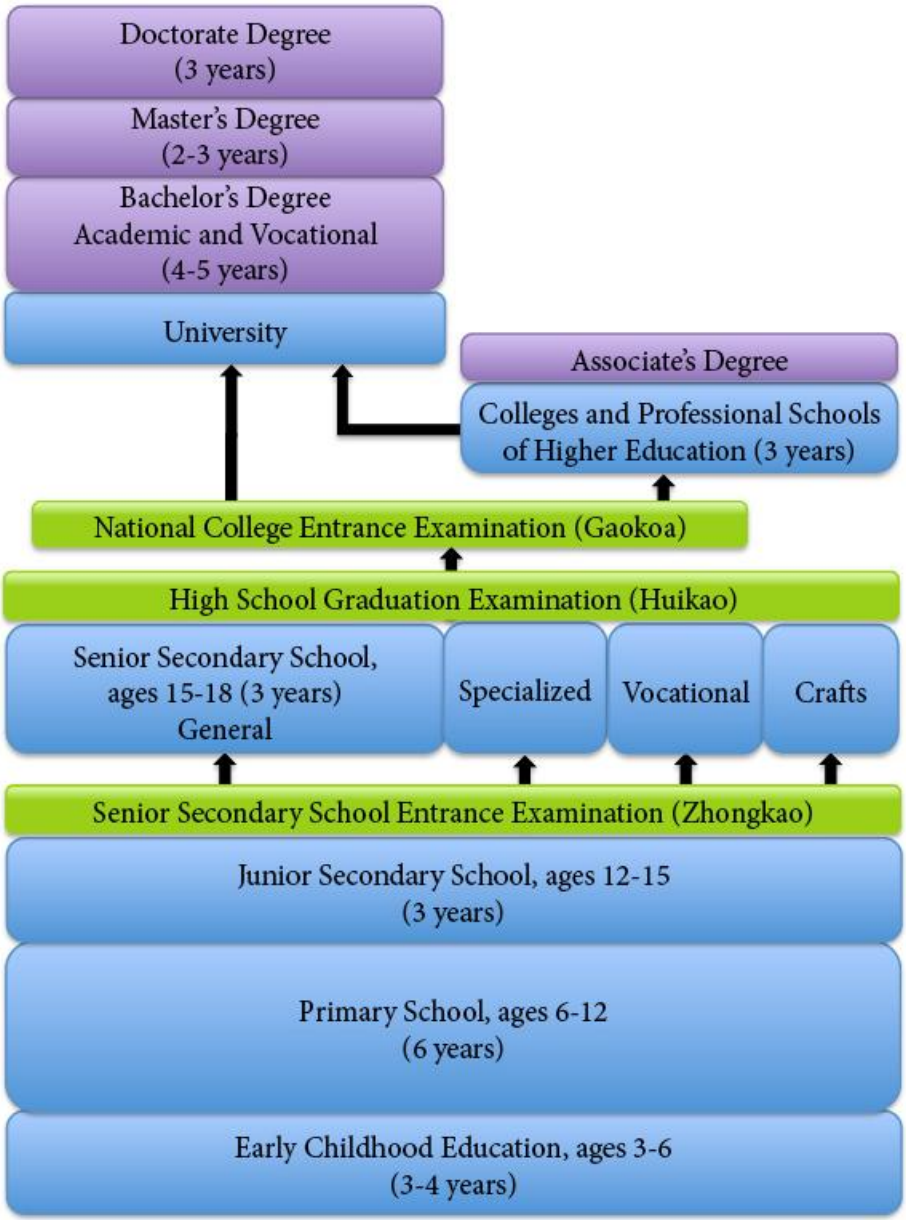
Source: CIA World Factbook (November 2012)
and *OECD Education at a Glance 2012*

PISA 2009 Mean Scores by Country for Reading, Mathematics, and Science



Source: OECD

China's Education System at a Glance



Among the things that the Shanghai government has worked on is a long-standing problem of wide disparity in the quality of the schools in their basic education system. The decrease in the size of the school-age cohort has helped. The government has evaluated their schools in terms of the quality of the physical structure and also the quality of the education program and it has classified its schools on a four level index on both dimensions. Those that meet the government's standards in both dimensions get an A. Those that qualify in neither get a D. Many C and D schools were simply closed. Some were merged into A and B schools, others reorganized after a renovation in the physical structure.

In many cases, teachers were transferred from high-performing schools to low-performing schools and from low-performing schools to high-performing schools. In some cases, outstanding principals were

asked to take over low-performing schools. In other cases, young or low-performing teachers and principals were transferred to high-performing schools, and, when they had learned how to perform competently, transferred back to their original schools.

In still other cases, low-performing schools were paired with high-performing schools, and with Teacher Professional Development Institutes, to build their capacity through this collaborative arrangement. And, in the most recent development, high-performing school managements have been asked to take on one or more low-performing schools as satellite schools. Often in such arrangements, a deputy principal in the high-performing school is asked to become the director of the satellite school. Another form of the same arrangement is the formation of consortium or cluster of schools around one very strong school in a collaborative.

Notwithstanding Shanghai's outstanding performance on the PISA assessments, many in Shanghai still see its education system as too rigid and its students as not sufficiently independent and creative to meet the challenges ahead.

Teacher and Principal Quality

Teaching has traditionally been a well-respected profession in China. Although Chinese teachers' salaries are not high, they are stable, particularly in big cities, and there are opportunities to supplement income through tutoring, which makes the profession attractive to many top candidates. Furthermore, universities allow priority admissions to teacher candidates, meaning that teacher programs often have the first choice of many top students.

Recruitment and Compensation

Teacher recruitment is not standardized in China. While it is a competitive job in urban areas, rural areas often must employ "supply teachers," or teachers who are primarily substitutes, in their local schools. These teachers are not held to the same training and certification standards as teachers in wealthier and more populated parts of China. This did not used to be the case; prior to the 1980s, there was no uniform standard for teacher certification, and teachers tended to take jobs in their local communities. However, following a large policy shift, teachers were required to become certified and they were put on the public payroll. This change caused many rural teachers to seek jobs in cities, where the standard of living was higher and their new certificates made them qualified for good jobs. This led to the shortage of teachers in rural areas, a problem that persists today.

In cities, teacher education programs at universities offer priority admission and are seen as a desirable option for strong students. In large, metropolitan cities like Shanghai and Beijing, teaching is seen as a respected, stable profession with competitive salaries. In these cities, teachers must hold degrees that far outpace what was required of teachers just twenty years ago.

Teacher compensation varies widely across China. In rural community schools, teachers are sometimes not even on the public payroll and thus their salaries are subject to local fundraising. In large cities, teacher salaries are competitive with other professions. Teaching is seen as a desirable career largely because compensation is considered steady. Because China's economy is changing so rapidly, many other

white-collar jobs can be unstable in large cities. In addition to comparable wages and stability, teachers are able to supplement their salaries through private tutoring and lectures.

Initial Education and Training

Teachers in China are educated in one of three types of schools. Special upper secondary schools can qualify teachers for pre-school and primary positions with the equivalent of a high school diploma. Normal colleges, equivalent to a junior college, typically train junior secondary teachers for two years following upper secondary school. Finally, normal universities train upper secondary teachers in a four-year bachelor's degree program.

Following the receipt of the required diploma, teachers must be certified, which requires two additional steps. First, they must pass the National Mandarin Language Test; afterwards, they must take four examinations in the areas of pedagogy, psychology, teaching methods, and teaching ability. Candidates must demonstrate teaching abilities such as classroom management as part of this examination. Teachers who attend a university for teacher education are exempt from the four examinations because it is assumed that they will have this knowledge as a result of their program of study. Despite this rigor, however, teachers are not always qualified. While 98% of primary school teachers were qualified in 2004, only 79% of upper secondary teachers were qualified. This number drops to 65% for upper secondary school teachers in rural areas, though the rate of qualified primary teachers remained high across the board.

In Shanghai, this system is slightly modified for primary school teachers. All primary school teachers must hold post-secondary, sub-degree diplomas, though they may enroll in a teacher education school immediately after completing junior secondary education. The programs are three to four years in length, and result in both a high school diploma and an additional certificate. These programs include courses in specific subjects, methodology and pedagogy. Teachers must also undergo practical training.

Secondary school teachers must hold bachelor's degrees along with a professional certificate, and many of these teachers also hold master's degrees. Prospective secondary school teachers undergo a similar set of courses and practical training to primary school teachers, but may only enter teacher education programs after successfully completing upper secondary school. For upper secondary school teaching candidates, the program is typically four years; for those who want to teach lower secondary school, the program may be as short as two to three years.

Career Ladders

Chinese teachers are categorized into four grades. Their ascent up the teaching career ladder is determined by professional evaluation. This evaluation is based largely on observations, and several other activities. These activities include performing demonstration lessons, providing mentorship and orientation to new teachers and submitting work to education and teaching publications.

For teachers interested in leadership roles, there are numerous paths to become involved in administrative work, and teachers can be promoted to administrative positions within schools, or to administrative and

official positions in the education bureaucracy. Nearly all government education officials started as teachers. In order to join the leadership track, teachers must have a distinguished teaching record.

Professional Development

There are many opportunities for professional development in Chinese schools, and the emphasis on teacher evaluation means that teachers are constantly working to improve their practice. Informally, teachers often observe one another's lessons in order either to learn from a more experienced or more effective teacher, or to serve in a mentorship capacity for a new or struggling teacher. Teachers also often meet in regularly scheduled groups based on subject and level in order to discuss best practices, share advice, and create common lesson plans for the upcoming week. Teachers spend hours both together and on their own preparing a 45-minute lesson. Occasionally, teachers will give demonstration lessons; these serve either as a means of imparting best practice to other teachers or as a means of feedback and critique to the teacher giving the lesson.

Shanghai schools require teachers to undergo continuous professional development throughout their careers. Teachers are required to spend 360 hours on professional development over each five-year period of their career. In 2008, to facilitate teacher development and collaboration, a web platform was established so teachers may access and share curriculum ideas, research papers and various other resources.

Instructional Systems

System Design

The Chinese education system consists of six years of primary school, three of lower secondary, and three of upper secondary. Children are required to attend the nine years of primary and lower secondary school; around the age of 15, they have the option of leaving school or entering an upper secondary program. All students attend an academic lower secondary school, at the end of which they take a locally administered entrance exam for upper secondary school. Depending on the results of this exam, they may enter an academic or a vocational upper secondary school, or they may choose to end their formal education. In academic upper secondary schools, students take classes in core and elective subjects over three years in preparation for university entrance exams; vocational schools offer coursework for two to four years in a number of occupational areas, including skills for managerial and technical personnel as well as in more traditional vocations such as agriculture. Across China, 52.5% of students attend academic upper secondary school; in Shanghai, this figure rises to 97%.

Curriculum

China has a national curriculum. Until 1988, China also used standardized syllabi and centrally-issued textbooks. In the late 1980s, however, the Chinese Ministry of Education began to approve the use of multiple texts and resources. Schools can now choose their materials from a ministry-approved list.

Much of China's educational system is built around examination preparation. Because examination results can essentially chart the course of a student's academic and work life, parents, teachers and students often focus on exams to the exclusion of all else. Many schools used to promote this focus,

removing all "extraneous" subjects, such as art, music and physical education from the schedule, leaving more hours for students to focus on the exam subjects. However, in recent years this has begun to change, with educators, policymakers and even parents coming to realize that the emphasis placed on high stakes tests may actually hinder performance. China now considers curriculum reform to be an important priority.

Shanghai has been working hard on curriculum reform, often piloting new curriculum before it is rolled out to the rest of the country. The thrust of curriculum reform since the late 1980s has been the de-emphasis on exams and the promotion of educational equity. There has also been a shift towards a focus on conceptual and experiential learning. In 1988, Shanghai established a three-block curriculum, which enabled students to participate in required and elective courses as well as extracurricular activities as part of their schooling, which was a major change from the previous curriculum focused solely on core subjects. Textbooks were redesigned to align with the new curriculum. Ten years later, new reforms produced a curriculum that integrated many subjects and was centered on student engagement. This focus on non-core subjects means that Shanghai students are required to do one hour of physical activity each day, and often participate in "service" or "social" learning, which involves community-service oriented field trips to learn more about their society.

The curriculum is organized around eight "learning domains," which are meant to encourage active inquiry and interdisciplinary understanding. These domains are language and literature, mathematics, natural science, social sciences, technology, arts, physical education and a practicum. The curriculum is also organized into three separate components: the basic curriculum (core subjects); the enriched curriculum (elective courses); and the inquiry-based curriculum (extra-curricular activities). With these domains and components in mind, schools are encouraged to adapt the government's curriculum frameworks to meet their students' needs. Teachers are encouraged to remember to "return class time to students" and "to every question there should be more than a single answer."

Instruction

Chinese class sizes are typically about 50 students, though this varies depending on the location of the school. In urban areas, where teachers are plentiful and population is strictly regulated, classes can be much smaller; in rural areas, where schools struggle to attract qualified professionals, classes may be 100 students or more. Teachers rely on extremely detailed study schemes and tend to teach only one type of class (for example, Senior Secondary 2 Physics) 12 to 15 times a week. They formulate these plans in consultation with other teachers in their subject area. Students are expected to learn both in and outside of the classroom; in order to ensure that students stay engaged with subject material after school hours, teachers assign daily homework, on which students often spend many hours a day.

In Shanghai, student engagement in the classroom is prized. Students are expected to be full participants in the lessons, which often include problem solving individually or in groups. This emphasis on student engagement is common in Chinese schools, but Shanghai schools have been leaders in focusing on understanding and application rather than memorization and have even instituted a limit on the number of hours of homework a student may be assigned per day. The top Shanghai schools have also ended the practice of holding classes on evenings or weekends, and all Shanghai schools have recently become more interested in developing a well-rounded student. Students take part in extracurricular activities to promote organization and leadership, and are required to do an hour of physical activity a day in addition

to their coursework. This is a clear departure from the traditional Chinese exclusive emphasis on core subjects and on rote learning.

Outside of school, however, students continue to receive a great deal of instruction in the core subjects, working with private tutors or enrolling in cram schools. These schools are more focused on drilling students in concepts and strategies. Even the top students typically participate in cram schools and tutoring, as examination results are still critical despite growing dissatisfaction with the emphasis on these tests.

Assessment

Chinese students receive formative assessments throughout their education. These typically take the form of year-end or term-end tests as well as casual assessment from teachers. They are also required to take graduation examinations at the end of primary, lower secondary and upper secondary school, in addition to the entrance examinations for the next level of schooling. These tests are formulated by the local education departments, and typically examine at least mathematics and Chinese language knowledge, though they can include other subjects. Students who hope to go on to university must also sit for a rigorous university entrance examination at the end of upper secondary school, the results of which have a major impact on their university acceptance prospects.

Gateways

There are two major gateways for Chinese students in their pre-tertiary education: the examinations at the end of lower and upper secondary school. Although it is possible for students who are not able to attend an elite lower secondary school to perform well on upper secondary entrance examinations, this is not likely, and therefore a child's ultimate educational success may be determined quite early on in his or her academic career. The examinations at the end of lower secondary school are locally administered, and their content differs across localities.

In 1985, the Ministry of Education granted Shanghai the right to create its own higher education entrance examination. This privilege has been granted to an increasing number of regions since then. Since 2001, the Shanghai examination has been based on the principle of testing what students can do, rather than what they can memorize, and includes "integrated papers" – essay questions in which students must demonstrate knowledge from multiple disciplines in order to respond. The university entrance test generally involves knowledge of the Chinese language, the English language and mathematics, as well as another subject, which is determined by the institution to which the student is applying. The fourth subject examination can be non-traditional, ranging from oral to written or even practical. As a response to the examination pressure on students, some Shanghai universities are de-emphasizing examination results, and basing more of their admissions process on other criteria such as overall student performance. The combination of Shanghai's rigorous education system and expanded options for applying to university mean that 80% of Shanghai students go on to university, compared to 24% in the rest of China.

System and School Organization

Education Finance

Over the past 30 years, the funding of Chinese schools has moved from a highly centralized, national funding system to one that is much more decentralized. This was largely due to an overhaul of all public funding in China in which a multi-level funding system was created. Now, local governments are primarily responsible for the provision, administration and funding of primary through upper secondary schools. This has resulted in a system that is highly inequitable across China, as rural areas have been unable to produce and allocate the same revenue as urban business centers, and consequently are sometimes unable even to pay their teachers. However, it has also meant that local governments can allocate funds in innovative ways; for example, Shanghai abolished the "Key School" system in which a handful of elite schools were privileged over all others for funding and resources, and has made the school funding system more equitable, producing better outcomes for a wider array of students. In addition to government funding, schools can also receive funding from private enterprises in the form of donations, or through school fees, without being classified as private schools.

In the past 15 to 20 years, the government has encouraged the establishment of private schools under the proviso that they will meet the same standards as public schools. Private schools had traditionally been attended primarily by the children of migrant workers because the jurisdictions to which they migrated were not obligated to provide them with any government services, so private schools catered to an underprivileged population. The government now hopes that by allowing private schools of a different sort – namely, elite schools with high admissions standards and presumably high tuition – they will encourage innovation in the fields of science, technology and education.

In 2008, China spent 3.3% of its GDP on education as compared to the OECD average of 5.9%. Per student, China spent $1593, as compared to the OECD average of $8,831.

School Management and Organization

The central Chinese government provides policy directives, curriculum guidelines and materials to all schools, but in the past few decades the government has begun to shift some responsibility from the national to the provincial and municipal levels. The Ministry of Education is responsible for setting the national curriculum, establishing standard syllabi for the curriculum's required subjects, evaluating and approving textbooks and teaching materials, supervising provincial education departments and providing special funding for underdeveloped school systems and teacher education programs.

The Education Departments (sometimes called Education Committees) for provinces and major cities are responsible for preparing the education development plans for their region, developing provincial curricula based on the national curriculum, choosing the teaching materials to be used in the province, administering school programs and providing education subsidies to local governments. They have the power to reform gateway examinations and set additional standards for teacher training and continued employment.

Local governments are responsible for implementing the curriculum and administering funding. At the school level, teachers are encouraged to develop their own lesson plans, and schools also have increasing freedom in adopting extracurricular subjects and teaching materials. Principals have some degree of control over staffing, and can set class sizes and teacher assignments.

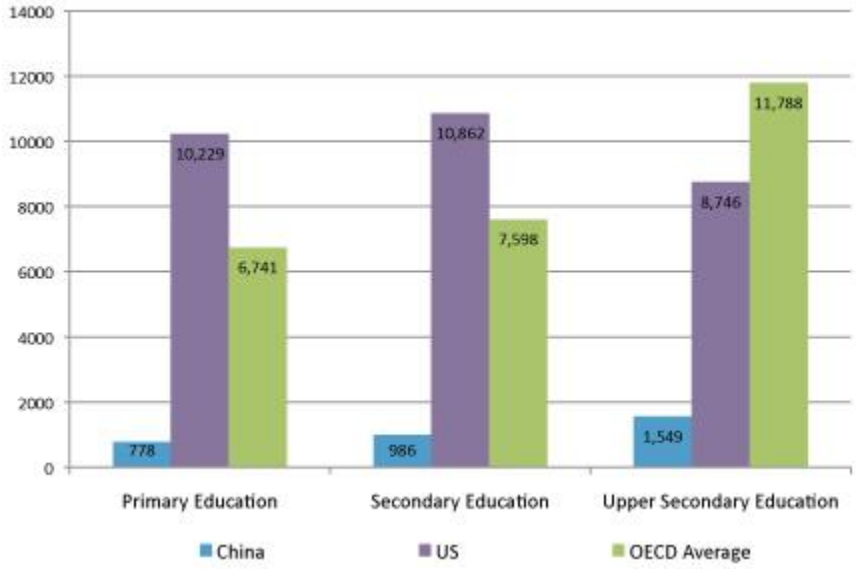
Shanghai schools have taken advantage of the opportunity they now have to take part in choosing materials. Schools can adopt materials provided to them by the ministry or they can now identify other teaching materials they would like to use, although these still require ministry approval before classroom implementation. Greater local control over school funding, too, has made a big difference in this region. Shanghai has grouped schools into clusters and partnerships to more easily share resources and administration, and has poured capital into improving the facilities of the majority of their schools, as well as working to distribute funding more equitably than in other parts of China.

Accountability and Incentive Systems

Accountability in China is managed through social expectations as well as limited systematic procedures and indicators. Teachers are expected to constantly be improving their practice through preparation and continuing development. They work closely with and are monitored frequently by their peers as well as school and government administrators, and these evaluations impact their career paths and salaries.

For members of the public who want specific performance indicators, they have access to school examination results. Because so much of Chinese educational success is based on these results, it is extremely easy for the public to determine which schools are successful and which are not; all are accountable in this way. Schools at all levels are informally ranked, and parents often choose which school their children attend. Prior to the 1990s, these school rankings were based on formative and summative student assessments and also affected teachers' incomes. However, the Ministry of Education has moved away from these measures, and has placed new emphasis on rating, rather than ranking, schools. The Shanghai Education Commission is also responsible for inspecting schools every three years based on both common measures and on the school's stated individual goals, taking into account research data and parent and teacher feedback.

Annual Expenditure by Educational Institutions per Student for All Services



(2007, in equivalent USD converted using PPPs for GDP, by level of education, public institutions only) Source:OECD

In Shanghai, teachers and principals are also held accountable by school administrators and their fellow teachers. Top performing educators are lauded and held up as examples to other educators, who are fully expected to draw lessons from their peers' success. Similarly, top performing educators are expected to aid in the development of their less successful peers. This process is facilitated through school partnerships and clusters as well as the practice of having successful school administrative teams temporarily take over the administration of lower performing schools, aiding both the students and the staff.

Parent and Community Participation

Educational success is completely bound up in familial and social expectations in China. Researchers consider familial interest and pressure to be the main motivating factors for a student; this, combined with high-stakes examinations at various points in the educational system means that students frequently spend the majority of their waking hours focused on their schoolwork and on self-improvement. Parents will often devote hours of family time in the evening to helping their children with their homework.

This familial pressure has led to a culture of "cram schools" and external tutoring in China. Students will often attend these schools or meet with private tutors after their official classes have ended for the day in order to improve their classroom performance and, more importantly, increase their odds for success on any important gateway exams, whether for upper secondary school or for university. It is estimated that 80% of Chinese students meet with exam tutors, and even parents who are opposed to the cram school culture will often engage tutors ahead of important assessments.

Education for All

Student Support Systems

Shanghai has turned its attention in recent years to ensuring greater access to education for all students, as well as greater support for struggling students. By 2020, Shanghai hopes to greatly reduce the student workload so that students are better able to thrive in the school environment, as well as create universal free preschool programs to give students a head start for primary school, or put them on even footing with children who attend private preschools.

The largest group of struggling students in China is children of migrant workers, who have not until recently been entitled to public education in the jurisdictions to which their parents migrate. Roughly 20% of Chinese students are the children of migrant workers. Two-thirds of those children live in cities with their parents, but the rest remain in rural villages without their parents. Ensuring educational achievement among this population is one of China's main concerns. In 2002, the Chinese government made it a policy that the education of migrant children is the responsibility of the city in which they live. Shanghai has a large proportion of migrant people living and working in the city, which has contributed to its economic expansion. Unlike the majority of other cities in China, Shanghai recognizes the importance of making sure that this large minority of students gets a quality education. Therefore, Shanghai has adopted a policy of integration, allowing migrant children to attend public schools alongside the children of Shanghai citizens.

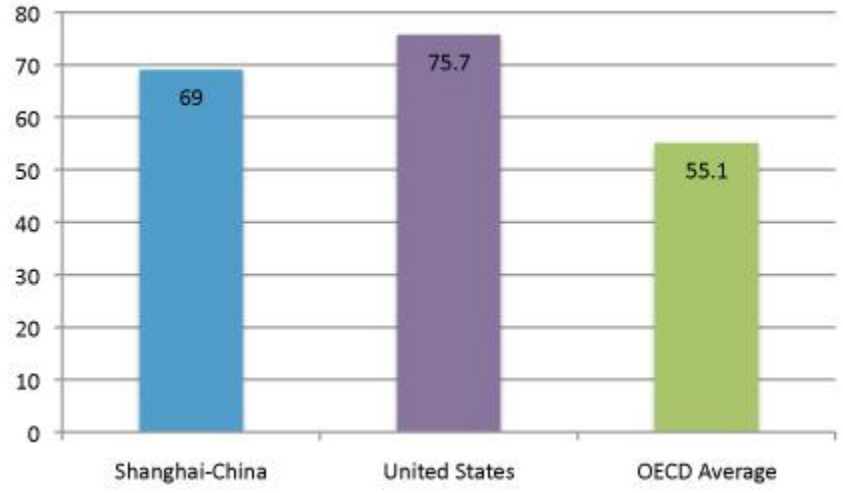
China's schools also provide a variety of options to students with special educational needs. These include special schools and/or classes to provide extra help in mainstream classrooms. In 1986, the government mandated that students with special needs must attend school for nine years as do children without special needs. Because some regions do not have the resources to provide special schools or classes for these students, a policy of suiban jiudu has emerged, roughly translating as "China's inclusion." Under this policy, regular schools would formulate special classes and teachers would make efforts to serve students with special needs in mainstream classes as well. This policy was initially adopted in the poor, rural areas of China and continues in areas where special needs cannot be formally provided for. However, the policy remains largely informal and rural teachers are not actually trained to provide special needs education to these students. A 2004 report from China's Ministry of Education indicates that in 1996-97 (the most recent year for which they provided data), 55.7% of students with special needs were educated in mainstream schools. This differs somewhat in Shanghai. The Shanghai Municipal Education Commission is working to develop formal special education pathways in mainstream and special schools, including the development of separate curricula and teaching materials for students with special needs. They have also formulated formal certificates of special education teacher training, and exempted special education schools from paying education fees or from paying for textbooks.

Low-Performing Schools

The Chinese have a long tradition of "Key Schools," or schools that receive greater resources than other schools, and are more selective. Because this system creates educational inequality, in the past few decades it has been on the decline. In the mid-1990s, Shanghai eliminated Key Schools by requiring students to attend their local school at the primary and lower secondary level, rather than compete for limited spots at local Key Schools. In response to parent concerns, this policy was modified somewhat by allowing students to attend schools in other neighborhoods if they were willing to pay a sponsorship fee. A new emphasis on neighborhood attendance has also had an impact on instruction; teachers were used to having fairly homogenous classrooms in regard to ability prior to this policy. Now teachers must undertake the more difficult task of teaching heterogeneous classrooms, and have stepped up to the challenge in most cases. Finally, neighborhood attendance has obviated the need for post-primary school exams, so students may spend more time learning and less time cramming in the early years of their education.

Shanghai has also been a leader in addressing the needs of low-performing schools. Several rounds of school renovations and restructurings have occurred since the 1980s; in addition to pouring in capital to fix buildings and purchase resources, the government has also sought to strengthen teaching staff and appoint competent principals and has eliminated tuition and supply fees for all students. Further efforts have included practicing positive discrimination in determining funding, transferring successful teachers to low-performing schools, and performing several rounds of renovations and school closings in order to bring all school physical resources up to an acceptable level. Finally, the Shanghai government has encouraged schools to take care of and learn from one another by establishing clusters of schools with different performance levels; creating pairs of urban and rural schools; requiring "good" schools to take over the administration of "weak" schools; and sending in hand-picked leaders and teachers to transfer "good" management practices.

PISA 2009: Variation in Reading Performance Explained by Schools' Socioeconomic Status



Source: OECD

School-to-Work Transition

Chinese students can choose to pursue vocational education around age 15. These programs are offered by vocational and technical schools at the upper secondary level; after completing upper secondary vocational education, students can go on to regional polytechnic colleges. These colleges are legally required to give admissions priority to graduates of vocational and technical schools, and provide on-the-job training as well as classroom-based learning. Students typically earn associate's degrees from these institutions.

This system was developed through a set of government initiatives from the late 1970s through the late 1990s, all of which sought to standardize and promote this type of learning as a support to China's economy. The government provides subsidies to students at both the national and provincial levels to encourage students to pursue vocational education, and ensures that teachers are up-to-date with industry needs, skills and standards by requiring them to spend one month in industry each year, and also promoting the hiring of part-time teachers who also work in industry.

Vocational education has, as a result of these reforms, become increasingly popular among Chinese students; between 1980-2001, the proportion of secondary vocational students increased from 19% to 45.3%. However, as access to university education is increasing, it appears these numbers are beginning to decline. Yet, vocational education remains a strong option: the Ministry of Education reports that 96.56% of graduates from vocational schools were able to find jobs, unlike university graduates who, due to their unprecedented high numbers in recent years, have greater difficulty. Various reports put the number for post-university employment anywhere between 70 and 94%.

The Chinese education system also offers many pathways for lifelong learning, some formal and others informal, run by universities, individuals and for-profit organizations. These include sabbatical study, evening programs and classes, distance learning courses and self-study examinations. Some of these programs and courses lead to certificates and diplomas.

Recent government initiatives have promoted the importance of adult education as China seeks to shake off its agrarian past and move forward as a science and technology leader. These initiatives are designed around pre-employment training for adults who left school early as well as basic education for adults who never attended school or who failed to develop these skills in school. A major component is literacy programs for middle-aged adults. Between 1949 and 2000, the adult illiteracy rate decreased from 80% to just over 8%.

OECD

STRONG PERFORMERS AND SUCCESSFUL REFORMERS IN EDUCATION: LESSONS FROM PISA FOR THE UNITED STATES (EXCERPT)

Strong Performers and Successful Reformers in Education

Lessons from PISA for the United States

OECD

4

Shanghai and Hong Kong: Two Distinct Examples of Education Reform in China

China has made huge strides in educating its population. During the Cultural Revolution, educated people, including teachers, were sent to rural areas to work in the fields. The teaching force was effectively destroyed. But, not three decades later, parts of the country – notably Shanghai – are among the contenders for top spots on the world's education league tables. Hong Kong reverted back to China in 1997 and has also made significant reforms to its education system.

This chapter looks at how China has made rapid progress, taking Shanghai and Hong Kong as examples of innovation. The main lessons include the government's abandonment of a system built around "key schools" for a small elite and its development of a more inclusive system in which all students are expected to perform at high levels; greatly raising teacher pay and upgrading teacher standards and teacher education; reducing the emphasis on rote learning and increasing the emphasis on deep understanding, the ability to apply knowledge to solving new problems and the ability to think creatively. All of these are reflected in deep reforms to the curriculum and examinations. These changes have been accompanied by greater curricular choice for students and more latitude for local authorities to decide on examination content, which in turn is loosening the constraints on curriculum and instruction.

INTRODUCTION

Despite China's emergence as one of the world's most influential economies, relatively little is known in other countries about China's educational system and how its students learn. People might have gained some insights either through the achievements of its students in universities abroad, or from their high scores in all kinds of tests. Otherwise, the prevailing impression is that students in China learn by rote, and that much in the schools is about memorising and cramming for examinations.

This chapter seeks to provide a more nuanced and accurate picture of education in China, using Shanghai and Hong Kong as examples. 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, as China encompasses such a diverse spectrum of economies, societies and cultures, Shanghai and Hong Kong can provide a very powerful window into education in China, but may not be representative of all parts of the country.

Nevertheless, in both cases, student learning is the focus, with other dimensions – such as teaching and teachers, school facilities and systemic strategies – providing the context and supporting various aspects of student learning.

CHINA'S EDUCATION SYSTEM: THE CULTURAL CONTEXT[1]

China has a long tradition of valuing education highly. This began with the Civil Examination system, established in 603 AD, which was also exported to Japan and Korea later in the 7th century. It was a very competitive yet efficient system for selecting officials, and was known for its rigor and fairness. These examinations evolved over many dynasties before their abolition in 1905.

The system had three tiers of examinations, at county, provincial and national levels. There were variations, but the general mode was basically an essay test, where the candidates were confined for days in an examination cell, fed with good food, and required to write essays of political relevance. To do this, they had to be familiar with the classics, basically the *Four Books* and *Five Classics*, and refer all arguments to these works – hence the requirement for "rote-learning". Good calligraphy and writing styles were also part of the basic requirements. The final level of selection was usually held in the Examinations Department, which was often part of the imperial organisation. Whoever gained the appreciation of the Emperor, who was virtually the chief examiner, would be the champion, followed by a few runners-up. These winners were appointed to various official posts according to their examination results.[2]

A few "beauties" of this system made it sustainable for almost two centuries. First, it was simple, requiring only performance in the examinations. Teachers were only affordable by wealthy families, so no formal institutions such as schools existed. It was basically a self-study system, or a "self-motivated distance learning system", in contemporary jargon. It was low-cost for both the government and the household because it involved only an examination, and the textbooks (the standard classics) were common in household collections. Apart from the exclusion of women (Elman, 2000), which was part of the broader ideology at the time, there were no entrance requirements, so it was thought that family background would not matter. Indeed, Chinese folklore over hundreds of years, reflected in novels, operas, dramas and all art forms, includes stories about scholars from poor families who endured years of hardship and poverty, became champions in the Civil Examination, were appointed ministers, married princesses and enjoyed glorious home-coming ceremonies. The Civil Examination drove almost all families, regardless of socio-economic status, to have high hopes for their children's future (*i.e.*, the boys), and such hopes translated into hard work and adaptability to difficult learning environments. This cultural tradition exists throughout the entire Chinese population. However, it has also led to the emphasis (almost the exclusive emphasis) on examination results for validating genuine learning or knowledge. In a way, for more than 16 centuries, generation after generation of young people were trained only to face the challenges of examinations.

This cultural respect for "education" hence carries a special meaning for China: education (basically examination preparation) is viewed as the sole route for upwards social mobility, the only hope for an individual's future. This is translated into a zest for credentials and the predominance of examinations to win them.

What are the consequences of this historic cultural emphasis on exams and credentials?

- Education was seen as the major path to climb the social ladder and change one's social status. This was intertwined with the supreme status given to civil servants (officials). And because of the Civil Examination, only scholars could become officials. A circular causality is at work here, where social status, officialdom, scholarship, and education became synonymous in people's minds.

- Despite the meagre odds of moving to the top, the chances of success mobilised the entire population to take examinations. This was strongly augmented by the assumption that working hard pays off. While other factors, such as family background and innate ability, are not controllable, working hard was something anyone could do. Some corollary observations may help explain the culture of education in contemporary China and to a large extent in other East Asian cultures.[3]
- Success in examinations is therefore still seen as the only respectable success, unlike in other societies where military capacity (such as with the *samurai* in Japan), or economic wealth can also attract social respect.[4]
- As a result of this history, reading, learning and education are often taken as synonyms in Chinese. Reading is regarded as the only effective means of learning, and for that matter of memorisation. "All are low but reading" is the saying; hence the tradition of "rote learning" as perceived by outside observers.
- The reality, however, was that achievements in education were decided by the subjective favour of the emperor or the chief examiner. Therefore successful essays conveyed ideas that would appeal to authority. This tradition may help explain the cultural aspect that favours political correctness over scientific objectivity.
- The importance attached to examination results also underpins the prevailing mentality among teachers, students and parents, in which the direct relevance of the curriculum is less important than achieving high scores.
- As most research results concur, motivation in education in China (and also in Japan and Korea) is basically extrinsic, prompted by family or social expectations (Chapter 6). In most cases, intrinsic motivation or genuine interest in the subject matter *per se*, are not the driving factors.
- This also underpins the fundamental source of examination pressure. In all these East Asian societies, frequent and intense examinations and tests in schools and high-stakes public examinations prevail throughout the entire education system, leading to all kinds of private tuition and tutorial schools to prepare students for examinations.
- The Civil Examinations tradition also explains the culture of hard work and tolerance of hardship. "Only those who could tolerate the bitterest among the bitter would come out as a man above men," as the saying goes.
- This tradition also underpins the belief that effort is more important than innate ability. "Diligence can compensate for stupidity" is a common Chinese belief, a view not shared by many other cultures.

The social emphasis on education has always made it easy for Chinese-based societies (such as mainland China, Hong Kong, Chinese Taipei and Macao) to develop their education systems, as there is popular support for expanding education to reach more people. However, at the same time, genuine attention to quality learning is often a challenge for education reformers in these societies.

CHINA'S EDUCATION SYSTEM: THE HISTORICAL CONTEXT

This system has undergone several stages of development: 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[5] higher education in the 21st century. With perhaps the exception of the Cultural Revolution, education in general has trended upwards, both in scale and quality.

The Cultural Revolution: 1966 to 1976

It is essential to understand the context in which China's education reform started in the early 1980s. The death of Mao Zedong in 1976 marked the end of the Cultural Revolution. Formally the Proletariat Cultural Revolution, it was started by Mao in 1966 as a national-scale political campaign to eliminate all bourgeois influences in the country's "superstructure" (as opposed to the economic infrastructure). Violent activities sought to remove and destroy all symbols of bourgeois culture, such as music, drama, opera and novels, and to make sure their replacements were rooted in proletariat ideology. Activities in all these art forms had to start again from scratch, using a few "model" prototypes created from pure proletariat ideology. It became a social campaign and intellectuals were the most vulnerable.

Among the revolution's consequences was the closing down of conventional schools. They were replaced with schools led by political teams of workers, peasants and soldiers, and the curriculum was totally revamped to reflect the essence of "class struggle." There were several attempts to resume schooling, but with little effect. Higher education institutions were suspended, replaced by new institutions admitting only workers, peasants and soldiers regardless of their academic merits. Professors and intellectuals were sent to factories, villages and remote places to be "re-educated." The concept reflected a utopian ideal of egalitarianism, where everybody produces for the state

and the state distributes its wealth equally among its citizens. But the reality was total stagnation of the economy, a society of "equal poverty", as economists recognised in hindsight. It is no exaggeration to say that China had to rebuild the entire education system in the late 1970s and early 1980s from the ruins left by the Cultural Revolution.

The reconstruction of education: Late 1970s through the 1980s

The end of the Cultural Revolution brought about unprecedented changes in China. In 1978, Deng Xiaoping started an economic reform in which peasants were given land and allowed to keep their crop surpluses. Commercial activities began to take place. Schools resumed normal activities. A milestone in education development at that time was the resumption of university admissions in 1977 (which doubled the intake) and 1978, when most of those enrolled were mature students who had been deprived of learning opportunities during the Cultural Revolution.

At the same time, peasants were eager to build their own schools in the villages. This led to a decision in 1980 to allow local non-government financing of schools as a way of mobilising community resources. This paved the way for a major reform and decentralisation of education in 1985. There was an immediate mushrooming of schools and the target of universal primary education was achieved in just a few years. The same reform also called for universal nine-year education as a national target, with benchmarks every year towards its accomplishment.

In 1986, China enacted the *Law of Compulsory Education*, which required every child to complete nine years of formal schooling – six years of primary school and three years of junior secondary school.[6] By the mid-1990s, China had basically achieved this goal.

At about the same time, in 1980, cities like Shanghai, with a large non-state enterprises sector, started pioneering new types of vocational schools that did not guarantee or assign jobs. This was a significant step away from the strict manpower planning that had been an integral part of the planned economy. By 1997, formal assignment of jobs to graduates disappeared from all levels of the education system. It was also in 1982 that China for the first time established its degree system for higher education, following the Western model.

It was not until 1988, however, that China moved away from uniform national textbooks to experiment with diversity in textbooks; until that point cultural tradition stated that these textbooks were the most essential instrument for student learning and were provided by the state almost free. (This was very different from practices in other developing countries of similar economic status). Textbook diversification allowed for diverse interpretations of the centralised syllabuses, and there were attempts, for example in Shanghai (see next section), to create new syllabi within the centralised framework.

Quantitative expansion: 1990 to the present day

China has now passed the stage of quantitative expansion in basic education. Official Chinese government statistics (for 2009) show a net enrolment of 99.4% at the primary school level, the envy of many countries. 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%. The general (*i.e.* academic) senior secondary schools enrol 52.5% of students at this level, putting about half of senior high school students in the academic stream (Figure 4.1). However, the figures may conceal regional disparities. In most urban areas, gross enrolment at the senior secondary level is 100% or above, which means that the number of students enrolled exceeds the number in the appropriate age group. (UNESCO Institute for Statistics figures aggregate data to primary, secondary and tertiary levels.)

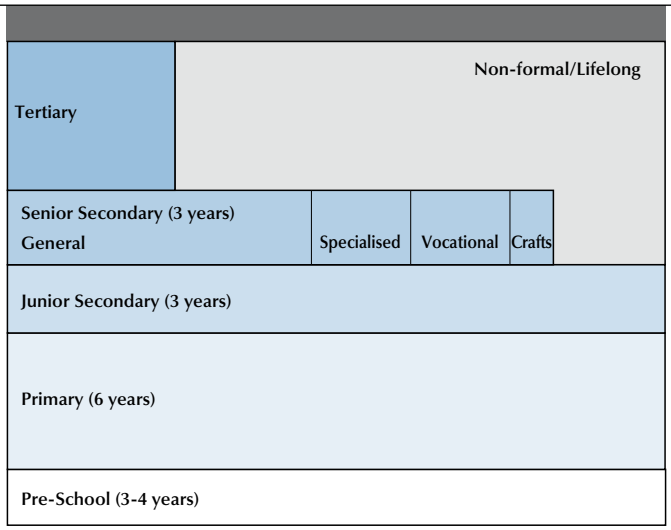
The 1985 reform, as mentioned earlier, established the framework for decentralised local school finance and governance. Almost as a textbook example, decentralisation led immediately to huge regional disparities because of the differences in local economies. After several back-and-forth debates and adjustments about degrees of decentralisation, the *Revised Law of Compulsory Education*, enacted in 2006, established differential subsidies from the central government to different regions of varied economic capacities.[8] This marked the government's determination to sustain universal basic education, and hence paved the way for more energetic reforms in educational quality.

The 21st century: Focus on higher education

If the highlight of the 1980s and 1990s was expansion of basic education to the entire population, then the emphasis of the first decade of the 21st century has been the expansion of higher education. Starting in 1998, China broke away from its long-standing policy of restricting higher education to a small percentage of the population and launched a spectacular expansion. In 1999, all institutions across the nation were required to increase intake by 50%. This was followed by jumps of 25% in 2000 and 22% in 2001.[9]

■ Figure 4.1 ■

China's education system organisation



Despite government intentions to pause this expansion, higher education has now gained its own momentum, and all kinds of non-government initiatives, such as private institutions and self-financing programmes, are flourishing at their own pace. The net result is that the higher education student population grew from less than 6 million in 1998 (before the expansion) to 29.8 million in 2009. Although the enrolment ratio still stood at a low of just under 25% in 2009 (Ministry of Education, 2010a), 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).

The expansion of higher education has immense implications for the entire education system. On the one hand, there is visible graduate unemployment, particularly in the major metropolitan areas, including Shanghai. Analysts often argue that this is mainly due to the unwillingness of graduates to take jobs with less satisfactory incomes or in less developed regions, and hence this should not deter further development of higher education.[10] And indeed the job situation does not appear to hamper parents' and young people's aspiration for more higher education. On the other hand, the rapid expansion of higher education has created a new level of desire for academic studies, inducing remarkably high enrolment in general (academic) senior secondary schools and lowering enrolment in vocational schools.

In all these expansions, private institutions emerge in great numbers, although in terms of percentage and student populations they are still the minority. However, the trend is irreversible. It is also noticeable that private institutions in mainland China are formally called *minban* schools, which means "community" schools, or more accurately, "non-government schools". The nomenclature is justifiable, because in China, public and private distinctions are rather blurred. For example, many private schools are headed by former government officials, or government departments may run private schools for income.

The quantitative picture would not be complete without including China's complex structure of lifelong learning, which includes full-time sabbatical study, evening spare-time programmes, distance learning programmes and self-study examinations. Such learning opportunities often lead to formal credentials such as certificates and diplomas, and sometimes to degrees. Operators range from major institutions of higher education (as their extension programmes), to individual professionals and private for-profit enterprises.

TEACHERS AND TEACHING

Teachers have always been a major issue in China. Educational expansion in the 1980s immediately led to an enormous shortage of teachers. In the Cultural Revolution, many young people with some education (such as primary or junior secondary) were branded intellectuals and sent to rural villages. They were seen as the most educated in the villages, and became teachers. Most of them were untrained, under-qualified and paid little.

They were generally called *minban* (community) teachers, but many were very competent and popular nonetheless. A policy in the 1980s aimed to retrain these teachers and put them on the public payroll. The success of this policy, however, has caused an exodus of teachers fleeing back to cities in search of better living and working conditions. Village schools now often resort to hiring even less qualified teachers using the "supply teachers" category that is meant for temporary substitutes. This is a structural problem that has yet to be solved. The disparity in competence among the vast number of China's teachers is perhaps a driving reason for the development of a comprehensive and effective system of organising teaching, as will be discussed below.

The situation in cities is more definite and positive. Since 1997, when universities began to charge fees, a state policy has given early admission to student teacher candidates. Hence, "normal" (teacher training) universities enjoy priority admissions and attract better students. In major cities, such as Beijing and Shanghai, where the economy is more open and incomes fluctuate more, teaching stands out as a preferred occupation attracting a more stable income. Over the years, because of the improvement in teachers' salary scales, teaching has risen up the ladder of preferred occupations.

It has to be added that while teachers in mainland China do not receive very high salaries, they often have other significant income on top of their salaries. This may come from additional assignments beyond normal responsibilities, income generated outside school (from private tutorials or invited talks), or school "bonuses" (*e.g.* sponsoring fees collected from students who come from other neighbourhoods or whose test scores are below the official admissions cut-off).

Class sizes in mainland China are generally large: the national norm is 50 students. However, in rural areas where good schools are sparse, it is not unusual to see classes of over 80 or in the extreme case, over 100. Parents often indicate their preference for better schools and better teachers over smaller classes. However, in major cities (and Shanghai is typical), recent drastic declines in population have forced local governments to adopt small classes so as to minimise teacher layoffs. This has significantly reduced teachers' workload and created room for student activities during lessons that would be impossible in large classes.

China has also developed a rather rigorous framework and system of teaching. At the grassroots level, subject-based "teaching-study groups" engage in study and improvement of teaching on a daily basis. For example, a physics teacher of Senior Secondary 2 (SS2) involved in a teaching-study group typically teaches 12-15 classes per week, teaching only one programme (*e.g.* SS2 Physics) and nothing else. There are timetabled sessions when the study group will meet, often with related personnel such as laboratory assistants, to draw up very detailed lesson schemes for a particular topic the following week. Teachers are expected to teach according to the scheme, which is then translated into more detailed lesson plans by and for individual teachers.

The lesson plan serves not only as a guide for the teacher during the lesson, but also as documentation of the teacher's professional performance. In many cases, teachers are observed by the school principal or by district education officers when they are being considered for promotions or awards. In short, a Chinese teacher sees a lesson more as a show or a performance, and puts in many hours of preparation to cover the standard 40-minute period.[11]

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. Professionally, all these "teaching-study" setups work under the Basic Education Department II within the central government's Ministry of Education. The Basic Education Department II is charged with all matters related to curriculum development, textbook production, pedagogy enhancement and school management for the whole nation. In a way, teaching in China is much more centrally organised than in many other systems.

During actual teaching, teachers may observe each other or may be observed by peers (in the case of a new teaching topic because of curriculum change, for example), by new teachers (so they can learn from more experienced teachers), by senior teachers (for mentoring), or by the school principal (for monitoring or for constructive development purposes). Sometimes, teachers are expected to teach demonstration lessons (called public lessons) for a large number of other teachers to observe and comment upon. This structured organisation of teaching in China is thus not only a means for administration; it is also a major platform for professional enhancement.

Such teaching protocols are present throughout China, from remote villages to prosperous cities. These practices are taken for granted as the basic protocol for teaching. Observers may see this as a matter of quality assurance, but it serves also the fundamental purposes of professional development and pedagogical advancement. The steps are built into teachers' career ladders.

Teachers in China are classified into four grades as an indication of their professional status. Promotion from one grade to the next often requires the capacity to give demonstration lessons, contributions to induction of new teachers, publications in journals or magazines about education or teaching, and so forth. Of course, many other aspects of education are unique to China, but the teaching protocols are perhaps among the most relevant to this chapter.

This picture of teaching in China would not be complete without mentioning that almost all the officers in the government education authorities, both at municipal and district levels, started as school teachers. Most of them distinguished themselves as teachers or school principals with strong track records. This perhaps explains their devoted professional attention to teaching and learning amidst all the administrative chores and political issues they normally contend with. They manage, however, to maintain this teaching focus while at the same time relying on a strategic vision that enables them to navigate a policy arena which goes well beyond education.

CONTINUOUS CURRICULUM REFORM

Ongoing reform is another dimension in the larger context of China's education system that merits attention. China has launched a series of reforms since the early 1980s; indeed, reform is a sustained concept in education. As noted earlier, major milestones include the nationwide reform in 1985 that decentralised finance and administration; a 1988 move to encourage local production of textbooks (rather than requiring a uniform set of textbooks across the nation); a spectacular expansion in higher education in 1999, together with a major re-design of higher education entrance examination in the same year; legislation in 2002 to encourage private schools; and a major policy move in 2006 to alleviate disparity in financial support for education.

The latest initiative is a major national comprehensive campaign to improve education in the next decade – the Outline for Medium and Long-term Development and Reform of Education (announced in July 2010). This prescribes education developments up to 2020. One of its ambitions is to introduce universal pre-school education. This is likely to pose new challenges given the nation's diverse conditions and concepts about early childhood development. The strategy also highlights the need to overcome educational disparity and the importance of respect for diversity and individual needs. It is generally regarded as a strategic plan for moving into an era of quality, equity and individuality in planning education.

Examinations have long been a focus of attention in China in any attempt to reform education. Teaching and learning, in secondary schools in particular, are predominantly determined by the examination syllabi, and school activities at that level are very much oriented towards exam preparation. Subjects such as music and art, and in some cases even physical education, are removed from the timetable because they are not covered in the public examinations. Schools work their students for long hours every day, and the work weeks extend into the weekends, mainly for additional exam preparation classes. As noted earlier, private tutorials, most of them profit-making, are widespread and have become almost a household necessity. In the past two decades, the national policy agenda has sought to move the system away from examination orientation, but the call has seldom met with significant success. The most recent appeal along this line is the move to reduce students' workload, which is regarded as a major task in the coming decade of education development.

Examination pressure remains a major concern to educators, parents and policy makers. Some provinces forbid the holding of formal classes over the weekends. There is a general belief that emphasis on examinations jeopardises the genuine development of young people and is detrimental to the entire national population, but few effective solutions have emerged to reduce or minimise examination pressures. Educators jokingly describe the situation as follows: "High-sounding appeals to promote quality education, down-to-earth preparation for examinations."

Nevertheless, committed reformers continue to make great efforts to reform the curriculum at the national level. A major document issued in 2001 calls for the following changes (Ministry of Education, 2001):

- To move away from pure knowledge transmission towards fostering learning attitudes and values.
- To move away from discipline-based knowledge, towards more comprehensive and balanced learning experiences.

- To move away from pure "bookish" knowledge and to improve relevance and interest in the content of a curriculum.
- To move away from repetitive and mechanistic rote-learning towards increased student participation, real-life experience, capacity in communications and teamwork, and ability to acquire new knowledge and to analyse and solve problems.
- To de-emphasise the screening and selective functions of assessments and instead to emphasise their formative and constructive functions.
- To move away from centralisation, so as to leave room for adaptation to local relevance and local needs.

Concrete changes include dilution of the disciplined structure of "subjects" so as to re-organise content according to life-relevance and progression in learning; the introduction of new integrated contents at the cross-over between natural sciences and humanities; the creation of elective arts modules as a compulsory part of the curriculum; to change examination formats from fact regurgitation to analyses and solutions for stated problems; and so forth.

It is clear that the reform discourse is one of "student learning"; a discourse that is shared by other similar reforms in Singapore and Hong Kong at almost the same time. The reform is strongly underpinned by the concepts of constructive learning. It is not just an improvement of the existing conventional curriculum, but an overhaul of the fundamental concept of curriculum, and hence it challenges basic assumptions about education and curriculum. It means not doing what has traditionally been done, but doing more, better and differently. Hence, it is curriculum reform in the genuine sense.

Understandably, this approach has received strong opposition from leading scientists in the academic establishment. They argued that such a curriculum would damage the integrity of the disciplines and would hinder the nation in producing new scientists. The constructive interpretation of learning has also led to debates among education researchers and policy advisors. Some interpret constructive learning as pure empirical experience, which deprives students of learning from earlier learning outcomes. Others regard constructive learning as the only effective approach to human learning, and insist that it should be the core tenet of curriculum reform.

The net result is progress in curriculum reform, but its momentum is very much hampered by academics' conceptual opposition, as well as by front-line teachers who have found the new curriculum difficult to handle when preparing their students to do well in public examinations. Nonetheless, the reform is gradually gaining ground.

The following discussion focuses on education and learning in two major Chinese cities: Shanghai and Hong Kong. Both are vibrant economies and have undertaken major comprehensive education reforms in the past two decades. While they have both inherited the same cultural traditions about education, the two cities work under different political and ideological frameworks. Nevertheless, their reform efforts share a similar discourse of making student learning central, but their different assumptions about the role of government have led them to adopt rather different approaches.

SHANGHAI: A LEADER IN REFORM

Shanghai is the largest city in China, with a population estimated by Chinese authorities to be approximately 20.7 million, of whom 13.8 million are registered residents, and 5.4 million are said to be temporary. In addition, there are around 1.5 million who are mobile (without a Shanghai home; Shanghai Municipal Statistics Bureau, 2010). The city is one of four municipalities with the status of a province (the others are Beijing, Tianjin and Chongqing). In 2009, Shanghai's GDP was USD 11 563 per capita. While its population and land account for 1% and 0.06% of the nation respectively, it contributes one-eighth of China's income (Information Office of Shanghai Municipality and Shanghai Municipal Statistics Bureau, 2010). In 2009, the contribution of the service sector to economic growth in Shanghai was around 60%, the highest in mainland China.

While Beijing is China's political centre, Shanghai is its undeniable business centre. Shanghai is also the country's most international and open city. This is attributable to its prosperous and colonial past before the change of government in 1949. It was among the first ports forced open by international powers in the mid-19th century.[12] After 1978, as China opened up to trade and began the transition to a market economy (the "socialist market economy"), Shanghai took on a new role in almost all fronts, including education.

Ahead of the pack in universal education

Shanghai is among the most internationalised cities of mainland China, but cultural traditions about education still prevail. Popular support for education means the city has had little difficulty in launching universal education. However, Shanghai also struggles with undue examination pressure, which is still a major item on the reform agenda.

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 cohort are admitted into higher education in one way or another (compared to the national figure of 24%; Ding, 2010). In other words, all those who would like to attend higher education are able to do so. There were 61 higher education institutions in Shanghai in 2009, plus quite a few private institutions yet to be officially recognised. There would be higher education over-supply if only residents of Shanghai were counted,[13] but Shanghai institutes also admit students from all over the nation.[14] Indeed, Shanghai has always been a preferred place to pursue higher education, perhaps second only to Beijing, and has attracted the best students from the national pool of elite candidates.

If it were not for the admission quota put aside for Shanghai high school graduates, the city could have attracted more and better candidates from the entire nation. Graduates from Shanghai's institutions are allowed to stay and work in Shanghai, regardless of their places of origin. For that reason, many "education migrants" now move to Shanghai mainly for to educate their children.[15] Of course, many Shanghai students attend higher education in other cities, usually Beijing.

Nevertheless, Shanghai is indeed an education hub in China, and is very high on the aspiration ladder for potential candidates. This situation has greatly strengthened the competitiveness of the city's higher education institutions. What is remarkable, however, is that even with the very generous admissions quota for local students, this sense of competition is still very keen. Reformers had thought that when the system became less selective, undue competition would also be reduced. This does not seem to have happened.

There are varied interpretations of this phenomenon, which is common to many Asian societies. One is that the Chinese perceive society as a vertical hierarchy[16] and always seek to enter the best institution despite broader access to higher education in general. Indeed, institutions are ranked in parents' minds. By the same token, parents would like to see their children ranked highest in their classes, and anything less than 100% is perceived as undesirable.[17] Another interpretation is that the cultural tradition cherishes hard work, and that to "study" (or "reading books" in the ancient tradition) is their "responsibility". Parents and teachers like to keep students busy studying and do not feel comfortable if students spend less time studying. Hence, despite the increase in higher education opportunities, examination pressure persists in Shanghai as in other parts of China.

The cultural heritage also works in positive directions. Shanghai is home to quite a few experimental programmes that are seen as pioneers in developing quality education as opposed to examination pressure. One such example is "success education" (Box 4.1).

Box 4.1 **Success education**

Shanghai's Zhabei district is characterised by high crime and poor educational performance. In 1994, Liu Jinghai became the principal of the Zhabei District School No. 8, a school that had been among the poorest-performing in the district. Mr. Liu applied a strategy called "success education" that he developed through years of research. The strategy encourages teachers to instill low-performing pupils with greater confidence in their abilities to become potential achievers. This program has transformed School No. 8, placing it in rank 15 out of 30 schools in the district. Around 80% of School No. 8 secondary graduates go on to university, compared with a municipal average of 56%. In 2005 the Shanghai Education Authority asked Mr. Liu to help turn around 10 other low-performing schools in Shanghai through "commissioned administration" whereby teachers from School No. 8 work with partner schools applying administrative and pedagogical practices of success education.

Reforming exams in Shanghai

Shanghai has opted to modify the mode and contents of examinations so they serve the purpose of curriculum and pedagogy reform. In Chinese phraseology, public examinations are the baton that conducts the entire orchestra – rather than removing the baton, the alternative is to modify the baton so that it conducts good music.

In 1985, Shanghai was given the privilege of organising the higher education entrance examination for universities under its jurisdictions. Since then, a lot of effort has gone into reforming assessments and examinations. Generally, exam changes match reform expectations in curriculum and pedagogy. As an example, integrated papers are required that cross disciplinary boundaries and test students' capacity to apply their knowledge to real-life problems. As another example, examination questions provide students with information not covered in the syllabuses and so test their abilities in applying what they know to new problems. Multiple-choice questions have disappeared from the city's public examinations.

Student engagement

One of the most essential influences of China's cultural heritage is the intensity of students' engagement in learning. Typically in a Shanghai classroom, students are fully occupied and fully engaged. Non-attentive students are not tolerated. In one mathematics lesson observed for this research, a lesson which was by no means unique, students at Junior Secondary II were learning about parabolas. Students covered 15 problems at their desks, plus selected students gave blackboard demonstrations. This is rather different from classrooms in other cultures, where students may not be required to be fully engaged or attentive throughout the entire lesson. Such intense concentration is considered a student's responsibility in Chinese culture.

Student engagement in learning is not limited to lessons. Homework is an essential part of their learning activities and in a way governs their lives at home after school. Parents expect students to do homework every evening and are prepared to devote their family lives to student study, again as part of ancient tradition. Homework is such a burden to students that many local authorities in China have stipulated a maximum amount of homework (measured in hours) that schools are allowed to assign. Shanghai was among the first areas to impose such limits as a municipal policy.

The intensity of students' engagement goes well beyond the schools. A rather comprehensive "remedial system" of tutorial schools caters to the demands of exam preparation.[18] In the absence of formal statistics, it is estimated that over 80% of parents send their children to tutorial school. Such schools are mostly for-profit, operate after school hours or at weekends, and tend to use small groups to focus on particular subjects. Parents see such tutorial schools as essential for enabling students to pass the public examinations with flying colours. Teachers are not totally against such schools either, because they also think that passing examinations is the prime aim of student study. Even parents who are against examination cramming often send their children to tutorial schools, almost as a matter of insurance. Those who go to such classes are not all weak students: even very strong students like to reinforce their strengths to achieve higher scores in the examinations.

Apart from the "remedial system", there is also the "supplementary system"[19] of institutions or programmes outside schools, where young people can learn music, fine arts, sports, martial arts (*gungfu*) and all kinds of subjects not offered by schools. The most popular are piano, flute, ballet, Chinese calligraphy and Chinese painting. Parents are very prepared to invest in these expensive learning activities.

Students' engagement in learning does not stop at academic study. They are obliged to take part in all kinds of other activities (*e.g* see Box 4.2). In Shanghai schools, for example, there is a municipal requirement that every student should engage in at least one hour per day of physical education. They start with a morning exercise before class; there is an "intermission exercise" in the middle of the morning, and other physical activities are held after school. Some schools practise "eye exercises" where students massage essential acupuncture points in order to prevent eyesight deterioration. Students also engage in all kinds of extracurricular activities in sports and the arts, where they are expected to learn organisation and leadership. Students take turns at "daily duties" in cleaning the classrooms and nearby corridors, for example. Students are also assigned teamwork in keeping the campus tidy. They are also organised to visit rural villages or deprived social groups as a matter of social or service learning. All these activities are co-ordinated by the municipal education authority.

Students are often overwhelmed by all these learning activities, both within and outside schools. This is why the national 2020 planning document calls for a "reduction of student workload." Shanghai is already much more aware of this issue than many other places in China, and good schools often refrain from holding classes during evenings and weekends, and parents do not normally press for heavier workloads.

Box 4.2 **Oriental Green Ark**

A spectacular facility established by the Shanghai municipal Education Department is an education base known as the Oriental Green Ark. This huge education park occupies more than 60 000 acres and includes activity centres, physical challenge centres, military training, museums, villas and hotels, as well as a convention centre. The villas and hotels follow the concept of a global village, with each block in the style of a particular nation. Every student in Shanghai primary and secondary schools experiences the Oriental Green Ark at least once as an organised school visit. It is interesting that many parents also send their children to the Ark through individual bookings at their own cost. Children see it as an alternative amusement park.

Compared with other societies, young people in Shanghai may be much more immersed in learning in the broadest sense of the term. The logical conclusion is that they learn more, even though what they learn and how they learn are subjects of constant debate. Critics see young people as being "fed" learning because they are seldom left on their own to learn in a way of their choice. They have little direct encounters with nature, for example, and little experience with society either. While they have learned a lot, they may not have learned how to learn. The Shanghai government is developing new policy interventions to reduce student workload and to refocus the quality of student learning experiences over quantity. Challenges from a changed and changing society maintain tension between such intense engagement and genuine learning in the broader sense.

Curriculum reforms

Shanghai has always been seen as a pioneer in education reform, with reform of the curriculum taking centre stage. Curriculum reform in Shanghai follows the general framework of national reform, described earlier. But Shanghai is often given the privilege of experimenting with reforms before they are endorsed for other parts of the nation. Since 1989, Shanghai has launched two waves of curriculum reform. Their essence has been to overcome "examination orientation" practices in schools in order to build quality education (Ding, 2010).[20]

The first phase of curriculum reform started in 1988, with an attempt to allow students to select courses of personal interest. A curriculum comprising three blocks was established: compulsory courses, elective courses and extra-curricular activities. Accordingly, textbooks and teaching materials were produced and phased in.

Curriculum reform moved into its second phase in 1998, to integrate natural science with the humanities, the national curriculum with school-based curriculum, and knowledge acquisition with active inquiry. The purpose was to transform students from passive receivers of knowledge to active participants in learning, so as to improve their capacity for creativity and self-development and to fully achieve their potential. Traditional subjects were re-organised into eight "learning domains": language and literature, mathematics, natural science, social sciences, technology, arts, physical education, and a practicum. Schools were encouraged to develop their own curricula specific to their individual conditions. Museums and other "youth education bases" (such as the Oriental Green Ark, Box 4.2) have now become crucial places in which the new curriculum is also implemented.

The new curriculum has three components: the *basic curriculum*, 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 asks students, backed up by support and guidance from teachers, to identify research topics based on their experiences. It is hoped that 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.

Overall, the curriculum reform involves broadening students' learning experiences, enhancing the relevance of subjects by relating them to broader human and social issues, and concentrating on the development of "capability" rather than accumulation of information and knowledge. These are reflected in the reform of examinations as well as reform in pedagogy.

The overhaul of curriculum is supported by changes in teacher education and professional development. Over the years, teachers' threshold qualifications have been significantly elevated. Twenty years ago, primary school teachers

were trained in teacher-training schools at the level of senior secondary schools. Junior secondary teachers received diplomas from sub-degree programmes. Less than 20 years later, all primary school teachers now must have a sub-degree diploma, and all teachers in secondary schools are degree-holders with professional certification. Many teachers have master's degrees. Shanghai was the first district in China to require CPD (continuous professional development) for teachers. Every teacher is expected to engage in 240 hours of professional development within five years.

In order to facilitate the sharing of good practices of curriculum design, development and implementation, a web-based platform[21] was constructed and put into use in 2008. Included on the website are resources for curriculum development and learning, success stories of curriculum implementation, and research papers on teaching and learning. The draft version of Shanghai's plan for educational reform and development for 2020, which has been put out for public consultation, calls for school-based curricula and proposes a credit system at the senior secondary level to make learning more individualised and flexible.

In parallel to the curriculum reforms are changes to teaching practice. These reforms aim to change classroom reality to better facilitate student learning. One very significant change has been implemented in recent years through the slogan "return class time to students". This calls for an increase in time allocated to student activities in classes relative to teachers' lecturing. This has caused a fundamental change in the perception of a good class, which was once typified by good teaching, with well-designed presentations by the teachers. Videos of model teaching concentrated on teachers' activities. Now, model classes are filmed with two cameras, one of which records student activities. Teachers' performances are now also evaluated by the time given to student participation and how well student activities are organised. A similar slogan is "to every question there should be more than a single answer." This poses a challenge to the orthodoxy and authority of teachers over the information they teach.

These changes add up to a sea change in classroom pedagogy. The use of slogans is a Chinese tradition, and proposed changes become a campaign. The slogans are carefully crafted to capture the very essence of the proposed change and to be easily understood and followed by grassroots teachers. This is particularly powerful in the rural schools, where most theories are still foreign ideas. The use of slogans in pedagogy reform is also based on the culture of what could be called "constructive conformity" in China. That is, teachers do not mind imitating other teachers' good practices, and indeed creative practices are meant to be copied. This is very different from the meaning of creativity in, say, the United States, where practices are called creative when they are different from others.

Redesigning examinations is another crucial element of Shanghai reform. In 1985, as noted earlier, Shanghai received permission to start an independent higher education entrance examination. This was a big step forward in two senses. First, admissions to higher education are a complex annual exercise on a national scale, and setting up a separate local examination was a deviation from the uniform system. Shanghai's experiment indeed heralded a trend in exam decentralisation, which is key to localised curricula. Second, Shanghai saw public examinations (in this case the higher education entrance exam) as key in the design of any new curriculum. Moving away from the central national entrance examination allowed Shanghai to have a comprehensive platform in reforming its curriculum.

Since 2001, the entrance examination has taken the form of "3+X": the three core subjects of Chinese language, English language and mathematics, plus the "X" of any other subject(s) as required by individual institutions or faculties. The "X" component may take the form of a paper-and-pencil examination, an oral examination, a test of practical skills and so on. The content may cover one discipline, one kind of ability, or several disciplines or abilities. Individual institutions decide on the weighting of the three core subjects and the "X" component. For example, at Shanghai University for Science and Technology, the three core subjects contribute to 40% of the candidate's overall scores and the "X" component is 60%.

In 2006, Fudan University, Shanghai Jiaotong University and six vocational higher education institutions started to organise their own entrance examinations and to set their own admission requirements. The two universities admitted 578 new students through self-organised examination. In 2007, another three institutions set their own entrance examinations (Shanghai Municipal Education Commission, 2008). The overall trend and intention is to diversify higher education entrance examinations so as to reduce the pressure from a single uniform exam. To lower exam pressures further, Shanghai has moved to allow admissions based on school recommendations at both senior secondary and university entrance levels. Other selected institutions, presumably the stronger, have also been given the autonomy to set their own admission criteria and entrance examinations. More recently, students are allowed to do self-recommendation for admissions at higher levels of education.

Overcoming disparity and inequality

China has in recent years joined the international community in realising the importance of overcoming disparity and inequality in education (and indeed in society at large). This is of particular significance since success in the overall reform has been based on a break from the extreme egalitarianism that prevailed during the Cultural Revolution. The breakthrough brought about by Deng Xiaoping, architect of the reform, was partly due to the concept of "let a few become rich first." Disparity was at that time seen as an incentive to the growth of national wealth and a cure to national poverty.

There has long been the concept of "key schools" in China. Key schools are selected by education authorities to be given additional resources and assigned better teachers. National key schools are very rare now, but provincial/municipal key schools and county/city district key schools persist. There are also key universities with privileged resources, although the term is no longer used to describe them. The key schools admit better students who then do better in terms of selection into higher-level key schools or universities. A senior secondary key school may have 100% of its graduates entering good universities, while a school at the bottom of the non-key category might not send any students to such institutions. This notion is taken for granted in a society conceived as a hierarchy, as noted earlier. Parents do not question the existence of such a system; they only think how their own children might win the competition to get into key schools.

In 1982, a national policy shift sought to remove the label of key schools at the primary level, but they still exist at junior-secondary and senior-secondary levels. Even at primary levels, "experimental" schools or schools under other labels, while lacking the title of key school, are privileged with better resources and better teachers.

Because of high demand under the key school system, it became necessary to have a highly selective public examination at the end of primary schooling to allocate students to junior secondary schools of different categories, and another public examination at the end of junior secondary schooling to allocate students to senior secondary schools. This explains the examination pressure that prevails over all sectors and all levels of the education system.

Neighbourhood attendance

In 1994, Shanghai was the first jurisdiction in China to introduce neighbourhood attendance at primary and junior secondary levels, requiring students to attend their local schools and in effect eliminating the notion of key schools at these levels. This was a challenge to society and caused some uneasiness among parents, who were bewildered that their children could no longer compete for admission to the better schools. The social pressure was so great that eventually a compromise was reached: students could choose schools in other neighbourhoods by paying a sponsorship fee. This is often known as the Chinese version of "school choice," which was a hot issue in America. Parents see the additional fees as fair, because otherwise preferential admissions could go to parents with political power or personal connections.

Neighbourhood attendance also caused concern among teachers who were not used to teaching classes of mixed abilities. Now, however, teachers seem to be proud of being able to handle children of diverse backgrounds and different abilities, realising that diversity and disparity within schools are common features in contemporary societies. Neighbourhood 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. Policy makers often see this as an essential factor in making Shanghai a champion of curriculum and pedagogy reforms.

Migrant children

Neighbourhood attendance also prepared the school system to face the challenges of migrant children, who became a major national problem in the late 1990s. In the 1980s, migrant workers flooded in from rural villages to work in urban areas. Most are low-wage labourers in factories, while others are contract workers on construction sites. Still others created small businesses to tap the urban market. Migrant workers have contributed immensely to China's economic growth, but their children and their education have become a national problem.

To date, around 30 million children of school age belong to migrant families all over China. This is 20% of the entire student population at the basic education level. In other words, one in every five school children comes from a migrant family. About 20 million are with their parents in cities, but the other 10 million have been left behind in villages without parental care. Both categories pose serious educational as well as social problems and have become a major issue on the government's agenda. They are also one of the major issues China pledged to tackle in its 2020 education plan.

Shanghai is one of the principal recipients of migrant workers because of its active industrial and commercial economies. Statistics in 2006 indicated that 80% of migrant children were of school age, and those who studied in Shanghai schools were 21.4% of the entire student population at the basic education level (Ding, 2010). Since 2002, national policy has been based on two statements (known as the policy of "Two Mainly"):[22] "Education of migrant children is mainly the responsibility of the recipient city", and "Migrant children should be educated mainly in public schools". These policies became necessary at a time when recipient cities did not want to spend local taxpayers' money on migrant children and when parents in public schools did not want to their own children to be mixed with migrant children. The national policy is interpreted differently in different cities.

Shanghai is among the cities that have dealt with migrant children with reason and sympathy. The city's spectacular economic growth can be very much attributed to the contribution of migrant workers, and it followed that their children should be well treated. Interviewees in this study also gave this reason for Shanghai's policies on migrant children's education:

Shanghai has historically always been a city of migrants. Children of the migrants today will stay on and become *bona fide* citizens of Shanghai. How they are treated today will determine how they feel towards and contribute to the future of Shanghai.[23]

An article in a recent issue of *Shanghai Education*, a very popular teachers' magazine, argued that migrant children from rural villages would have positive effects on urban children. The migrant children brought in characteristics such as frugality and perseverance, while urban children from one-child families may be quick in mind and broad in knowledge but spoilt in their personalities. Hence the article argues for "bilateral integration" so that children of all origins can benefit from each other's company.

In a way, Shanghai has established the notion that migrant children are "our children" and works constructively to include them in its educational development. Meanwhile, at the system level, the admission of migrant children to public schools helps solve the problem caused by the acute decline of school-age children among the permanent residents.

Strengthening weak schools

Another major undertaking in Shanghai has been to improve the school system by converting "weaker schools" to stronger schools. Since the 1980s, several rounds of school renovation attempted to ensure that schools were in sound physical condition. In the mid-1990s, the demographic decline began to show, which gave the government a good opportunity to further improve the schools (Jin, 2003). In 1999, Shanghai started a second wave of school renovation, upgrading school buildings and facilities according to a "standard programme." A total of 1 569 schools were either re-organised or closed, accounting for three-quarters of all schools in Shanghai. A third wave of school renovation started in 2002, and one-third of junior secondary schools in Shanghai benefited. The second and third rounds included other reform measures, such as strengthening the team of teachers or selecting a strong principal.

With the improved economy, the Shanghai municipal government has been keen to improve households' capacity to support children's education. Since 2006, all students 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 (Shanghai Municipal Education Commission, 2009). Although basic education is free and compulsory, the quality of schools varies, and that affects the quality of education children receive. Indeed, public schools in Shanghai have long been criticised for the disparity among them.

In order to reduce this disparity, the Shanghai government has adopted several strategies.[24] The first, as mentioned earlier, is *school renovation*. The government evaluates schools in terms of their infrastructure and educational quality, and then classifies them into Levels A, B, C and D. Level A schools meet the government's standards for both infrastructure and quality, while Level D schools meet neither standard. With the decrease in the number of school-age children, quite a few Level C and D schools were closed. Others were merged into Level A or B schools or reorganised in the second and third waves of renovation. When the third renovation wave ended in 2005, Level C and D schools disappeared and all public schools became Level A or B. In junior secondary education, 64% of public schools are Level A.

The second strategy is known as *financial transfer payment*, which is the mobilisation of public funding with positive discrimination. Statistics showed that per-student expenditure in rural areas was only 50% to 60% of that in the city.

Rural schools also had far lower capital spending than downtown schools on average (Shanghai Municipal Education Commission, 2004). The strategy was then to set a minimum standard for per-student public expenditure at different levels, and to transfer public funds to the deprived areas. Between 2004 and 2008, over USD 500 million was transferred to rural schools to help them build new facilities and laboratories, update older ones, purchase books and audiovisual materials, and increase teacher salaries.

The third strategy 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. For example, it was reported that in Qingpu District, a rural area, 160 experienced teachers in relatively poor junior secondary schools resigned between 1997 and 2002.[25] To reverse the situation, the government transferred a considerable number of teachers from urban public schools to rural schools, along with some outstanding urban principals (Shanghai Municipal Education Commission, 2008). 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 fourth strategy is to *pair off* urban districts with rural districts. In 2005, the educational authorities of nine urban districts signed three-year agreements with educational authorities of nine rural districts. The authorities exchange and discuss their educational development plans and join hands to deal with problems such as teachers' capacity building. Teachers' Professional Development Institutes affiliated to both authorities share their curricula, teaching materials and good practices. Moreover, some 91 schools paired up as sister schools, and a substantial number of teachers undertook exchange programmes among the sister schools (Shanghai Municipal Education Commission, 2009). The first round of the three-year "pairing off" programme ended in 2008, and the second round is under way.

The fifth strategy is relatively new but has gained increasing attention. It is called *commissioned administration*, a kind of school custody programme in which the government commissions "good" public schools to take over the administration of "weak" ones. Under this scheme, 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. It is believed that the ethos, management style and teaching methods of the good schools can in this way be transferred to the poorer school.

In 2007, the Shanghai municipal government asked 10 good schools in downtown and other educational intermediary agencies to take charge of 20 schools providing compulsory education in 10 rural districts and counties. The good schools/agencies and the rural schools signed a two-year contract that required the former to send senior administrators and experienced teachers to the latter. The city government bears the cost of the partnership (Shanghai Municipal Education Commission, 2008); Shanghai Municipal Education Commission, 2009). Such an arrangement not only benefits the poor schools; it also gives the good schools more room to promote their teachers.[26]

The sixth strategy is to establish a *consortium* of schools, 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 (Box 4.3).

Box 4.3 **The Qibao Education Group**

Qibao is a suburb of Shanghai. Its secondary school, established in 1947, has become known for the humanist values that permeate all aspects of school life. It is also known for the percentage of its graduates admitted to good universities. Some graduates from Qibao have been directly admitted to Harvard University. Since the 1960s, Qibao Secondary School has been identified as an "experimental school" or a "demonstration school" because of its effective leadership, and it has been famous in the realms of science education, sports, arts and music, and technology. Under the leadership of Principal Qiu Zhonghai, the Qibao Education Group was established in 2005 with Qibao Secondary School as the core. To date it hosts six schools. Three other public schools were renamed and "adopted" by Qibao, while two private secondary schools, one junior and one senior, were newly established by the group. All six schools have demonstrated continuous improvement since becoming members of the Qibao Group.

Source: A focus group discussion with administrators of the group, 2010.

Achievements and challenges in Shanghai's education system

External observers might see the development and practice of education in Shanghai as very effective. Shanghai participated in PISA 2009 and achieved very high average results overall (Table 4.1, OECD, 2010). Although these results were not yet available at the time of this study, there was consensus among all those interviewed (see list at end of chapter) on some positive developments including some improvements on local measurements of student learning. Local experts believe that this is evidence of successful reforms, whereby students are now exposed to a much broader knowledge base and are trained to integrate their knowledge and tackle real-life problems. Students have also become used to identifying questions of interest to themselves, and to make open-ended explorations. All these changes are markedly different from the traditional Chinese pattern in which students learn subjects by heart and regurgitate such knowledge in examinations.

Table 4.1 Shanghai-China's mean scores on reading, mathematics and science scales in PISA

	PISA 2000	PISA 2003	PISA 2006	PISA 2009
	Mean score	Mean score	Mean score	Mean score
Reading				556
Mathematics				600
Science				575

Source: OECD (2010), *PISA 2009 Results: What Students Know and Can Do: Student Performance in Reading, Mathematics and Science (Volume I)*, OECD Publishing.
StatLink http://dx.doi.org/10.1787/888932366674

However, none of the interviewees was satisfied with the quality of Shanghai's education system. As one experienced educator insightfully expressed it, the changes in student learning were brought about chiefly by organised and structured top-down reforms, implemented either through examinations or policy shifts.[27] Such measures may be well designed, but students are still not given much autonomy in their study. Schools with outstanding characteristics are still rare, and examination pressure still prevails.

There is little expectation of any fundamental change in the near future, given that in comparison to injustice from abuses of power or payments of money, examination scores are seen to be "scientific," "reliable" and hence "fair." However, the dictates of the examinations have left students with little time and room for learning on their own. "There is an opportunity cost in terms of time and space," said the interviewee. "Students grow within narrow margins" and are not fully prepared for their lives and work in the future. This is seen as a deep crisis, exacerbated by the reality of single-child families.

HONG KONG'S EDUCATION SYSTEM: ONE COUNTRY, TWO SYSTEMS

Hong Kong was originally a small fishing island that was ceded to the British government in 1842 after China's defeat in the Sino-British War ("The Opium War"). In further treaties in the late 19th century, China also lost the Kowloon Peninsula and the New Territories to Britain on a 99-year lease. Hong Kong maintained its colonial status at the end of the Second World War when all other "unequal treaties" with China were terminated. In 1997 the 99-year lease ended. Following a surprise suggestion from Deng Xiaoping to British Prime Minister Margaret Thatcher, Hong Kong's sovereignty was returned to China under the "one country, two systems" notion.

Under this arrangement, China resumed its sovereignty over Hong Kong, but Hong Kong remained a separate jurisdiction, governed by a "Basic Law" and enjoying autonomy in all areas except military defence and diplomatic relations. As a Special Administrative Region of China (SAR), Hong Kong maintains an independent legislature, with a distinct currency and policies of its own, independent from the national government in Beijing. In the realm of education, for example, Hong Kong maintains its own system of education under an Education Bureau (EDB) which reports only to the Hong Kong government and Hong Kong taxpayers, without direct relations with the Ministry of Education in Beijing. Meanwhile, Hong Kong is free to engage in bilateral relations with other jurisdictions and assume membership in other international organisations for finance, commercial, education, culture and so forth. Hong Kong's education system has been and remains quite distinct from that of the rest of China, with a unique history, structure and reform trajectory.

Hong Kong has a population of around 7 million living in a small area of 1 000 square kilometres. Its average GDP per capita is often cited to be above USD 42 000, bringing it within the world's top ten richest nations on most lists.[28] The service sector of the economy accounts for 92% of Hong Kong's economic growth. Across the border on the Chinese mainland, an estimated 80 million people work for Hong Kong investors.

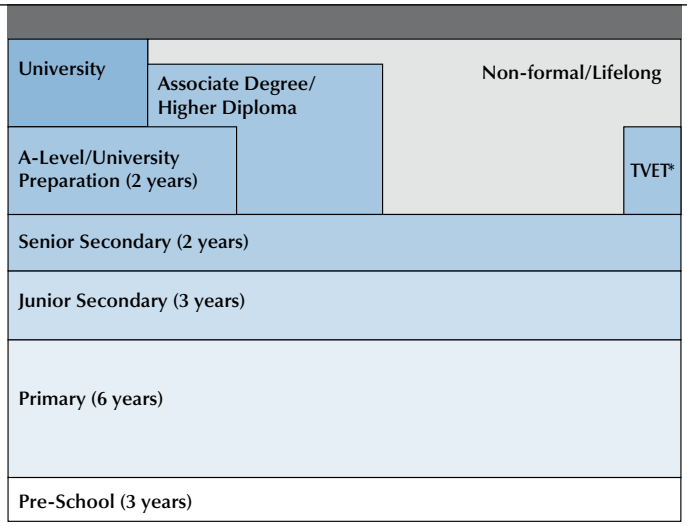
The population is predominantly ethnic Chinese. Caucasians from Western countries living in Hong Kong are small in number but mostly work for influential multinationals. The ethnic Chinese derive from immigrations at different periods of history. Increasingly, they come from mainland China, either as immigrants who stay on or as tourists or migrants who reside in Hong Kong temporarily. Small but significant portions of the population are from Indonesia and the Philippines, most with temporary permits to work as domestic helpers. Traditionally, residents of South Asian origin include businessmen from India, manual or service workers from Pakistan and former Ghurkas from Nepal. Hong Kong residents, both men and women, have life expectancies that are among the longest in the world.

Hong Kong hosts an education system comprising around 1 100 schools. However, the number is shrinking because of dramatic declines in population. Each age cohort has declined from around 9 000 members in the early 1980s to around 4 000 in recent years. The fertility rate is around 0.9 children per woman, far less than the "replacement" level of 2.1 children per woman.

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. The certificate is a gateway for all young people, either to work or further study. It is followed by a two-year matriculation education (known as Forms 6 and 7) in preparation for the A-Level examinations, which aim at admissions to higher education (Figure 4.2a). However, this system is facing an overhaul, as we will discuss below.

■ Figure 4.2a ■

Hong Kong's education system organisation until 2012



* Technical and Vocational Education and Training.

The post-war years: The foundations of an elitist system

Whilst the school system on the Chinese mainland only began after 1905 with the abolition of the Civil Examinations, Hong Kong already had schools in place long before that and they were not influenced by changes on the mainland. The leading elite Hong Kong schools followed the model of the British "public" (*i.e.*, private) schools. Nonetheless, the Hong Kong population has always been predominantly Chinese, and the schools have largely been adapted to the Chinese culture. This was also aided by British colonial localisation policies, particularly after the Second World War. Hence, it is fair to say that the Hong Kong education system is very much a hybrid of Chinese culture and British traditions and schools enjoy the best of both worlds.

Hong Kong's education remained rather elitist even after the Second World War and until the 1960s. There was only one university, the University of Hong Kong, which took in only 100 to 200 students each year. A rather stringent primary school examination later evolved into the Secondary Schools Entrance Examination, so that the traditional examination pressure prevailed at the primary level, even though primary schooling was already widespread. The post-war baby boom caused school attendance to soar, but secondary schools remained very selective.

There have never been many government schools in Hong Kong. However, since the 1950s, the government has been subsidising non-government school-sponsoring bodies (mainly churches, charitable organisations and other associations or agencies) and with them formed a public school system. Many such schools once operated under marginal conditions (such as on the rooftops of public housing), but were given land and buildings in the 1970s and 1980s. Now they enjoy state-of-the-art facilities. In brief, the Hong Kong government provides most of the capital cost and almost the full recurrent cost of public schools, but expects the non-government sponsoring bodies to run them. The sponsoring bodies abide by a Code of Aid, a kind of contractual agreement with the government. In a way, the "aided schools" are near to the US concept of charter schools, except that the Code of Aid governs operational procedures rather than performance.

Hong Kong still has quite a few elite schools whose graduates are favoured candidates for admission to the best universities in the world. It is notable that such students are not necessarily from wealthy families. Hong Kong strongly exemplifies the Chinese belief that young people achieve because of hard work, regardless of family background. However, its schools are not only strong in academic achievements; often they are also champions in sports and music, and most graduates have become leaders in higher education, mainly because of their vibrant and autonomous student organisations. The Hong Kong schools breed leaders.

Private schools, many of them for-profit, mushroomed in the 1970s to respond to the shortage of school places. Such schools tended to offer low-quality education and as a result gradually disappeared during the 1980s because of expansion in the public sector. Since the turn of the century, however, a new breed of elite private schools has been established as international schools, though admitting mainly local students.

The push for universal education: 1960s onwards

In 1965, new legislation introduced compulsory six-year primary education. Actual primary enrolment was already near 100%.[29] This was followed by heated debate about whether to offer three years of free schooling after the primary level. There was tension between government expansion plans and escalating social aspirations for more education. The tug-of-war was about the speed of expansion. Government plans, bold as they were, attempted to maintain a pyramidal structure in response to the manpower needs of the manufacturing industrial economy, the main thrust of Hong Kong's economic "miracle" in the 1970s and 1980s. That is, the government maintained a very small percentage in the enrolment of higher education, while steadily expanding senior secondary education and providing universal education for primary and junior secondary. Meanwhile, social equity goals emerged in the 1970s, leading to calls for universal secondary education. Due to international pressures, mainly from the General Agreement on Tariffs and Trade (GATT), Hong Kong introduced nine-year compulsory education in 1978.[30]

The next step was to abolish the Secondary Schools Entrance Examination. This could be regarded as an historic first step to release the schools from formal public examinations, at least at the primary level. However, schools remain different in their standards. The replacement for exams as placement mechanisms was a "scientific" approach that combined school internal assessments, an aptitude test to scale the internal assessments across schools, a classification of students into five capacity bands, and parental choice after random picks by computers. In the end, however, the best students were still admitted to the best schools. The public examination was gone, but schools still managed to create all kinds of tests as a tangible yardstick for performance. Drilling survived, and the situation did not change until the comprehensive reform discussed below.

The aspiration for education did not stop at the introduction of nine-year compulsory schooling. It was a textbook example of how increased supply led to increased demand. Without much intervention from the government, enrolment in secondary education was again near universal by the end of the 1980s. This was augmented by a rather sophisticated system of vocational education (programmes for apprenticeship, craftsmen and technicians) with the milestone establishment of the Vocational Training Council in 1982.

The next battle was for higher education expansion. Until the early 1980s, Hong Kong maintained a small gross enrolment ratio of 1-2%, with a 3% increment in the intake each year. Local enrolments were limited to two universities, and those who could afford it would go abroad to study in overseas institutions. There were several attempts to expand access to higher education, but government determination to do so came only in 1988. That year saw an exodus of emigrants because of the forthcoming handover in sovereignty to China, as well as other political change. This situation prompted the Hong Kong government to expand its formal higher education intake to 18% of the eligible population. Another tug-of-war ensued between government policies and social aspirations, now focused on this tertiary education level. By the early 1990s, however, the 18% target was achieved.

The 1990s to the present day: The movement towards comprehensive education reform

From the late 1990s the discourse in Hong Kong shifted from one of expansion to one of "what should education offer." A comprehensive education reform began in 1999. This initiative emerged at a time of rather comprehensive dissatisfaction with the education system. Parents were not satisfied with the education schools were providing and were often upset by unpleasant experiences their children were undergoing, particularly in the newer public schools. For example, children were working on homework until almost midnight, and most of what they did was little more than regurgitation. They subjected their children, unwillingly, to tough competition in order to move to better schools. Those who could afford it sent their children to international schools that were liberal in their philosophies and where children seemed happier. Teachers in turn were dissatisfied with their students, thinking standards and motivation were declining. Employers were also dissatisfied with the quality and calibre of graduates from local institutions, finding them less prepared to engage in an increasingly complex workplace. They were turning to recruiting returnees from studying overseas.

In hindsight, this dissatisfaction can be explained by a few crucial factors. First, schools were unprepared for an intake that suddenly changed from a select few to almost everybody. The system now had greater student "mixability", but teachers still maintained approaches generally used for teaching the elite, in which only the capable students would benefit and the slower students were abandoned. Second, the sense of responsibility changed following the introduction of compulsory education. While students could be blamed for performing poorly in schools they had struggled to enter, when education became compulsory blame was laid on schools and teachers, even though they had been badly prepared. Third, although there had been successful reforms in curriculum and pedagogy (such as the introduction of integrated science in junior secondary schools and the change to an "activities approach" in primary classes, both in the 1970s), the general environment still favoured a conventional curriculum and didactic teaching. This was reinforced by the highly competitive public examinations and keen selection process for higher education. Fourth, and perhaps most fundamentally, employment patterns had undergone major changes. While young people with only a nine-year education could previously easily find employment as blue-collar unskilled labourers in manufacturing plants, such factories had mostly moved across the border into southern China where labour costs were much cheaper (thanks to China's open policies). The corresponding expansion of Hong Kong's service sector was accompanied by an expectation of higher knowledge in its labour force.

In sum, at the end of the 20th century Hong Kong's education system faced a multitude of structural crises, partly due to the efforts to accommodate more children and partly due to changes in society's expectations for education.

Seen from this perspective, the apparent failure of the system at that time was less a problem of government incompetence or ill-management than a demonstration of the widening gap between a rapidly changing society and the static approaches to education. The solution was not to do more and better of what schools had been doing, but to put education in a different framework. That was the starting point for Hong Kong's comprehensive education reform which began in 1999 and continues today.

The reform was led by the Education Commission, the overseeing advisory body in education policies. The Commission's core comprised four people: the Chair, who was head of a major international bank; a university professor with world-wide experience; an insightful school principal; and the Permanent Secretary for Education, who was a committed reformer.

The reform started with a "mobilisation phase". Some 800 community leaders were invited to a major gathering to air their concerns. The meeting started with a presentation titled "Questioning Education," which asked over 100 questions with no answers. Participants assumed the roles of parents, employers and corporate citizens, and expressed such anger that they fuelled the Education Commission with determination to never go back to the old ways. A subsequent campaign encouraged every school to establish a paper "tree of hope" onto which students hung tags with statements beginning, "I have a hope: Education should be …"

The design phase followed. A document that asked questions about the "Aims of Education" was published. It described recent changes in society and proposed a list of fresh aims for education. Upon public invitation, more than 40 000 suggestions were submitted. It became a community campaign and greatly enriched the Education Commission's understanding of how society was changing and its implications for education.

Meanwhile, as part of the learning process, the Education Commission carried out a series of innovative consultations to aid their decision making. Major professional bodies were interviewed to solicit their views. A typical example

was the Society of Accountants, which suggested that the best action for a university to take towards accounting was to "not teach it".[31] Another study looked at manpower aspirations among small and medium enterprises (SMEs) that were becoming the backbone of Hong Kong's economy. This was a genuine learning process for the Education Commission, which was discovering that fundamental changes were occurring in society and the workplace, but that the general design for education had not kept pace.

The Education Commission also studied education reform in other systems, as well as patterns of lifelong learning in OECD countries,[32] and supply and demand in the local market for lifelong learning. The Commission looked at ways to retrain the newly unemployed and visited trade unions in order to understand the trends of employment in various industries.

By the end of this stage, it was relatively clear that the reform, despite its comprehensive nature, would have to concentrate on three aspects: the system's structure, its curriculum and assessments. Subcommittees were established to design these different aspects of the reform.

In 2001, as a first step in the reform, public assessments after primary schooling were abolished with immediate effect. This caused some confusion among school principals and teachers, who had to seek new frames of reference. However, the move has proved critical to primary schools, allowing teachers to develop more relevant school-based learning activities and changing the general discourse in primary schools from one of examinations and drills to one of learning. As a result, in less than a decade, secondary schools are seeing more active learners coming out of primary schools, with improvements in student performance as assessed in consecutive international comparisons in reading literacy. For example, in PIRLS (Progress in International Reading Literacy Study), 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 (Table 4.2; OECD, 2010).

Table 4.2 Hong Kong-China's mean scores on reading, mathematics and science scales in PISA

	PISA 2000	PISA 2003	PISA 2006	PISA 2009
	Mean score	Mean score	Mean score	Mean score
Reading	525	510	536	533
Mathematics		550	547	555
Science			542	549

Source: OECD (2010), *PISA 2009 Results: What Students Know and Can Do: Student Performance in Reading, Mathematics and Science* (Volume I), OECD Publishing.
StatLink http://dx.doi.org/10.1787/888932366674

In 2002, a crucial reform document – *Learning to Learn* – was published (Curriculum Development Institute, 2001). The title carries two major messages: the change of focus from "teaching" to "learning," and a new emphasis on the process of learning rather than memorising facts. This document, still the basic reference for the entire reform effort, was informed by the contemporary theories of learning. In layman's language, these theories hold that:[33]

- Learning is the active construction of knowledge by the learner.
- Learning is a process, achieved through activities called learning experiences.
- Similar experiences may lead to the construction of different kinds of knowledge, *i.e.* to people learning differently.
- Learning is for understanding.
- Understanding is demonstrated by the effective application of the knowledge thus constructed.
- Effective learning experiences often require integration of knowledge.
- Learning is therefore best in real-life experiences with actual effects.
- Learning is also a social action, best achieved in groups.
- Human learning is motivated by a sense of improvement.

This is just a synopsis of the general principles of theories of constructive learning. The reform exercise in Hong Kong incorporates the common denominator of theories about learning, rather than committing itself to any particular school of "constructivism."

The consequences of reform for secondary school and higher education

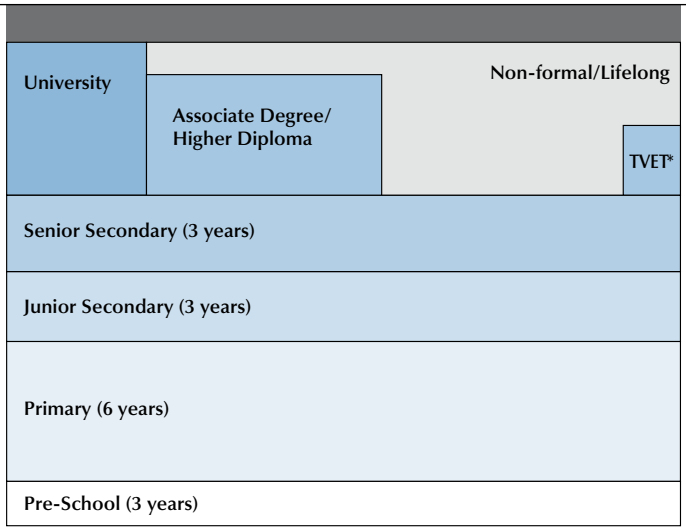
Although the change in curriculum was at all levels, the consequences have been most noticeable at senior secondary level:

- The secondary school curriculum is designed according to what learning experiences students need, rather than being guided by manpower needs in the economy.
- The curriculum is decided in secondary schools before seeking endorsement from universities. The latter's concern is to select the best students, while the curriculum reform aims for lifelong benefits for students.
- The secondary school curriculum is framed around eight key learning areas (KLA), rather than "subjects": Chinese Language, English Language, Mathematics, Science and Technology, Social Science and Humanities, Sports and Arts, Applied Learning (to allow students to gain real-life workplace experiences) and Other Learning Experiences (including service learning, workplace visits and overseas experiences). The latter two are new to both teachers and schools.
- A long process of negotiation with higher education institutions resulted in a compromise in which secondary school students going on to university are expected to perform in four areas: Chinese, English, Mathematics, and a new subject called Liberal Studies (see next point). Institutions and programmes may also ask for one other "subject." This reflects a change among higher education institutions from basing their student selections on the number of subjects studied (as if that would guarantee better academic performance) to understanding the benefit of requiring less and allowing broader learning experiences among their candidates.
- 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. In effect, teachers allow students to design their own learning schemes in which they rely mostly on current affairs and non-textbook information, and develop high-order or critical thinking. This includes asking sensible questions; finding directions for analysis, synthesis and conceptualisation; and proposing hypotheses or theories.

All these overhauls to the curriculum are carried out in the context of structural change to the school system, where junior-secondary, senior-secondary and higher education will shift from 5 years + 2 years + 3 years (following the British model) to 3 years + 3 years + 4 years, so that achieving a bachelor's degree will now take four years instead of three (Figure 4.2b).

■ Figure 4.2b ■

Hong Kong's education system organisation after 2012



* Technical and Vocational Education and Training.

The focus in higher education now is how to make the best use of the additional year in the new system. Almost all institutions have decided not to extend specialised studies in the additional year but to offer alternative learning experiences, following the spirit of the reform in secondary curricula. Such alternative learning experiences include a new common core curriculum, all kinds of experiential learning and expansion of overseas exchanges.

It is conceivable that after 2012, the higher education scene will be very different. After years of discussion and design, the New Senior Secondary (NSS) curriculum was launched towards the end of 2009 in anticipation of a new public examination in 2012, when university entrance requirements will change accordingly. As this chapter is being written, both secondary and higher education institutions are busy preparing for the change.

Critical to the reform is construction of a new assessment system to facilitate the changes in curriculum and pedagogy. This is underway, and faces the dual task of reflecting the new philosophy of learning and gaining international recognition for university admissions.

Key factors in managing the reform

The Hong Kong education reform has benefited from a long lead time, well-designed preparations and good management of perceptions.

Preparation

Starting in 2005, four years before implementation of the new curriculum, the government organised meticulous activities to prepare schools for it. In a typical exercise, representatives from 12 schools would gather in a hotel for at least one whole-day "retreat". Each delegation would have six members: the supervisor, one school board member, the principal, the vice-principal and two senior teachers. The retreat usually started with a talk from a prominent community leader on how "society has changed". The Curriculum Development Institute then outlined the curriculum reform, and each school delegation was asked to discuss their initial strategies for implementing it. The school groups then exchanged views.

Forty-five such sessions were held and all schools were covered. The government then went on to do similar training sessions with middle managers, such as subject department heads. Such perception-management exercises have eased schools into the changes, allowed them to develop ownership of the reforms, and minimised unnecessary resistance during the long reform process. This was essential given that the increased workload and disturbance for schools were by no means trivial. The bulk of preparation for the reform stayed with the schools. The reform could be seen as a combination of centralised design, school-based implementation and professional support.

Managing perceptions

Another crucial factor has been the inclusion of the media in the entire process. At the early stages of designing the reform, seminars were held for reporters on the fundamental principles of the reform philosophy. There were constant interactions with chief editors of the major media to involve them in engaging the public in the reform. However, since the process has already taken 11 years, changes in personnel both in government and the media have required a special effort to sustain the relationships.

Media relations are only one aspect of "perception management" for the reform. Through the years, despite the different reform phases, consistent themes have been *i)* societal change; and *ii)* concentration on student learning. In the earlier years of consultation and design, many documents started with the phrase "Society has changed!" People from all walks of life contributed to the theme. Meanwhile, emphasis on student learning and sustained discussions continuously enriched that theme. Numerous seminars and conferences were held on various aspects of education, but these two themes remained constant.

However, there is no uniform model of reform implementation. Indeed, its very core was respect for individual needs, and hence the evolution of schools into more autonomous entities. Under the general theme, and with the pulling force of the public and university entrance exams, schools have developed rather diverse approaches to implementing the reform. Nonetheless, because of the change led by the reform, schools across the board have developed their own mechanisms of collective decision making and division of labour which respect their individual school cultures.

ACHIEVEMENTS AND CHALLENGES IN HONG KONG'S EDUCATION SYSTEM

The Hong Kong education system has been reformed several times, but people tended to shun the word "reform" until the most recent overhaul. Overall, the Hong Kong government is known for its philosophy of positive non-intervention, although that has often been challenged in recent years. In the two decades after the war, the Hong Kong government did not intervene in the school system beyond providing subsidies. Even in later years, when government action

in developing and reforming education became significant, the general understanding remained that government intervention should be minimal. This philosophy could be called the "governmentality" of Hong Kong, to use Foucault's term.[34] This is fundamentally different from other jurisdictions where governments see themselves as the comprehensive controllers of all things happening in schools. However, the notion is very much challenged by critics who not only do not believe in the concept but also doubt whether it is actually practised by the Hong Kong government. However, the vaguer notion of "small government, great market" is still something that Hong Kong honours.

The philosophy of "positive non-intervention" becomes a challenge because Hong Kong celebrates school autonomy and denounces anything that would downplay school-based endeavours. The result is great disparity among its schools. Another consequence is that unlike practices in Shanghai and Singapore, where weaker schools are often the focus of attention and measures are taken to strengthen them, Hong Kong is reluctant even to rank schools. The result has been that some public schools receive standard public funding yet deliver sub-standard educational services. Parents see this as unfair. Changing the situation may not be straightforward, however, because it entails a different kind of accountability to allow the government to actively intervene.

Nevertheless, Hong Kong's comprehensive reform is succeeding because of its strong rationale: fundamental change in society requires new ways of looking at human learning. The reform challenges the very basics of student learning and how such learning can best be achieved.

LESSONS FROM SHANGHAI AND HONG KONG

Shanghai and Hong Kong represent two different approaches to education, which makes it worthwhile to look at them separately. Yet despite the differences, the students of both cities consistently perform well in international comparisons, as the PISA results testify. It is interesting to compare some of the common features of the two cities: they share a cultural heritage that treasures education, yet their students suffer from tremendous examination pressure. They share a colonial past, although colonial rule in Hong Kong lasted much longer. Both are major metropolitan centres in China, and indeed in Asia, and both prosper because of the vibrant cultures produced by highly-educated citizens.

However, the cities have followed very different development paths over the past six decades. Shanghai became a major industrial centre under the government of the People's Republic, and later, at the opening of China, moved on to become the city with the most remarkable development in the service sector. Before 1997, Hong Kong remained outside China, and hence was relatively immune from its political fluctuations. It hosts the country's freest market and has become the centre of finance and management for the whole of Asia.

Both societies felt the need for fundamental reforms of their education 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.

Shanghai belongs to an organised society and approached education reform in an organised way. It would be inaccurate to describe the Shanghai reform as top-down, because unmistakable and remarkable initiatives emerged from the grassroots. However, the municipal government did not only design the reform but also effectively intervened in the process, for example in running schools and improving teaching.

Hong Kong is almost the opposite. Its reform provides schools with a platform, supports them with resources and modifies the public examination as well as university admissions, but leaves the process of reform to the schools. Teachers may find this difficult because changes in the curriculum and examinations have made their familiar paths invalid. But the reform has pushed schools and teachers to take a professional stand, exercise professional autonomy and adapt the changes to best fit their respective student bodies.

Hence, reform in the two cities has given us a very good opportunity to observe two systems of education, both strong in international comparisons and assessments, to showcase a whole spectrum of possibilities.

This section discusses factors not analysed in the preceding sections because they are less explicit and are largely taken for granted by the Chinese themselves, but very important for those who might be interested in learning from the Chinese experience.

▪ Building legitimacy

Both Shanghai and Hong Kong aim high in their educational ambitions, both as a systemic target goal and to meet individual aspirations. They both use statements about education to guide their reforms, which take a moralistic

approach. In the 1990s, Shanghai used the slogan of "first class city" and added "first class city, first class education". Although the definition of "first class" remains vague, the concept drives the development of education and keeps education high on the policy agenda.

Hong Kong has always felt insecure in international competitions, and much of its competitive edge is being challenged by mainland China and by other jurisdictions in the vicinity, such as Singapore, Malaysia, and even Macao. Hong Kong has identified "six pillars" for its further development, and building an "education hub" is one of them.[35]

The sustained emphasis on education carried in these statements attracts the attention and support of the entire society. It underpins the allocation of substantial government resources to education and helps mobilise community resources. And as good education cannot be achieved only by teachers, the statement is an appeal to support from all parts of society. In other words, a consistent continuous movement creates and reinforces the legitimacy of educational development.

A recent example is China's *Outline of the Medium and Long Term Plan for Development and Reform of Education* (Ministry of Education of the PRC, 2010b), a blueprint for education in 2020 and perhaps beyond. The initial "consultation" draft, published in February 2010, took more than 18 months to produce. The process involved thousands of professionals and experts and more than 23 000 seminars and forums for brainstorming, and was accompanied by technical reports totalling more than five million words. It received 2.1 million submissions from all walks of society.

After the consultation draft launch in February, further discussion and revisions included provisional plans for interpretation and implementation. The exercise was chaired by Prime Minister Wen Jiabao and went through the State Council and then received endorsement from the Central Committee of the Chinese Communist Party and eventually the Politbureau, just to make sure of its high priority in the political arena. Such a strong effort in legitimacy-building is unusual, but will guarantee that the educational reform movement will carry huge momentum.

However, legitimacy means very different things in other societies and systems. There are diverse ways that governments can build and enhance the legitimacy of their policies. While the approaches in Shanghai and Hong Kong may not apply to other societies, the attention they gave to building legitimacy for education is of crucial importance.

▪ Reform to break ranks with tradition

It is difficult to say which of the factors observed are due to cultural heritage and which are due to policy interventions and practices. They are intertwined. However, in both Shanghai and Hong Kong, deep cultural influences in values surrounding education (such as the emphasis on exams) have been perceived as problems and have provoked a reaction in order to modernise the system: moving from elite to massive popular education, from emphasis on teaching to emphasis on learning, from fact memorisation to development of learning capacities, and from economic needs to individual needs. In both cases, the change in the nature and orientation of the entire education system involves struggles against the culture.

Hence, if we really want to understand anything useful from the two systems in Shanghai and Hong Kong, the first is the sense of *reform* as a value. Both Shanghai and Hong Kong have resorted to fundamental and comprehensive reforms in education, and without much mutual communication they started almost at the same time. This sense of *reform* is also shared by Singapore (Chapter 7), which started its comprehensive education reforms in the late 1990s. It was also the intention of the reforms in Japan (Chapter 6) and South Korea[36] in the mid-1980s. The degree of success in these reforms varies, but intolerance of the ill effects of cultural heritage was a common factor.

▪ Root and branch reform versus superficial improvement

These experiences show us that reform is not equivalent to improvement. "Improvement" means doing what the system has been doing all along, but more and better. "Reform" involves paradigm shifts. In other words, the notion of a *reform* entails an awareness that further development of education is not only a matter of remedying perceived shortcomings; it is an understanding that more fundamental issues exist where education has to catch up with changes in society. Without such an understanding, any "improvement" of the system and practices only reinforces what might have gone wrong. This is perhaps the problem with education policies in many other systems. Often, worries surround students' under-performance in visible areas such as language and mathematics but pay no attention to the fact that the entire curriculum and pedagogy could be obsolete. "Improvement" would then mean the repetition and reinforcement of obsolete approaches to education.

So the legitimate questions a country could ask itself are: *Education for all, but for what purpose? Quality assurance in education, but what quality is expected?*

▪ The importance of instruction for learning

A key factor behind the accomplishment of the two cities' systems is that they took *learning* as the core concern in their educational reforms. It might sound odd that we should remind educators and policy makers that learning should be the core business of education. However, reforms in some other systems emphasise systemic planning or finance, school management or accountability, without actually looking at the causes, environments and processes of student learning. It is easy to forget that structure, policy, standards, finance and so on make no difference at all unless they affect the instruction that students get and what they ultimately learn. In this sense, both systems are to be congratulated for moving away from the tradition in which education (based on examination preparation) is reaffirmed without actually understanding the process of learning.

The core position of *learning* comes into play only when one understands how the changes in society and the economy affect the function of education. In a typical industrial society, the prime function of education is to prepare manpower and provide the relevant credentials. Once in the workplace, individuals are protected by orders, procedures, rules and regulations, regardless of their personal knowledge and characteristics. This function is now diminishing as the pyramidal structure collapses, replaced by small work units where individuals have to face clients, to solve problems, to design products or solutions, to endure risks and to face moral and ethical dilemmas. Knowledge and personality are of prime importance, and education has to prepare young people for this.

It is noticeable that in both Shanghai and Hong Kong, the attention to learning is not so much a matter of puritan educational ideals but rather an awakening to the future needs of society. Attention to social change and attention to learning are two sides of the same coin. Hence, to reinforce the point made in the last section, genuine reform in education has to start with an analysis of society and its changes.

By the same token, 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 (such as slogans in Shanghai) among grassroots teachers; and *v)* perception management to convince parents and the media of the value of the changes. All these dimensions have to be strategically co-ordinated and synchronised, and this in turn requires champions who are committed to the concepts.

Because of the usual confusion between learning, study and education, it is often essential to roll out the education reforms in phases. The beauty of a campaign is that there are milestones and phased targets, so that reform activities do not deteriorate in bureaucratic hands that might turn them into administrative routines. This could also explain many failures of education reform elsewhere which, despite a dramatic start, quickly become conventional.

▪ Reform that looks at the whole system and the whole student

Both 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 are complex human beings, and the improvement in their educational achievement can be accomplished only when all the complex contextual factors are considered and changed. The reforms perceived education as the development of the student as a whole. 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.

The reforms also try to mobilise all sectors of society and are seen as an undertaking that concerns everyone. As mentioned earlier, they started with different frameworks: The Shanghai reform was launched as "first-rate city, first-rate education" and regarded education as part of a comprehensive aim of building a world-class city. Education reform was sold as a way to increase Shanghai's competitiveness in the global arena. The Hong Kong reform started with the awareness that "society has changed" and young people had to be prepared for a totally new society and precarious future developments. But both societies positioned education as a core element in the city's future. Hence, the reforms not only received priority consideration on the governments' agenda, but all sectors of society are expected to participate and give support.

▪ A capable centre with authority and legitimacy to act

Decentralisation is the overwhelming focus for the current literature on education planning and governance, but the subject may deserve a more nuanced look. Without suggesting that centralisation is a virtue, finding a balance between central and local control, or choosing a degree of decentralisation, is perhaps something all governments

must handle carefully. Education is no exception. Such a balance is perhaps contingent on the specific circumstances and popular beliefs of societies at particular times of social development. This is reflected in the two contrasting set-ups in Shanghai and Hong Kong. A single government organ, the Education Bureau, co-ordinates all matters concerning education in Hong Kong and administers more than 1 000 schools. This centralised set up has the advantage of equal distribution of research funding and equal student unit expenditures. Schools are also not left on their own or in small clusters where reforms might not be straightforward. Shanghai, whose population is larger than Hong Kong, is divided into city districts that each runs its own schools using local finance. However, the municipal government retains its policy making and co-ordinating authority, and maintains strong monitoring to ensure parity among schools. Each approach appears to have its unique virtues.

▪ The public examinations: a positive way to facilitate learning

Policy makers and curriculum reformers see attitudes towards the public examinations as a major hurdle in opening doors for broader learning experiences for students. Hence, as discussed earlier, much of the reform effort seeks to counteract the adverse effects of the public examination.

Nevertheless, it is also true that the exam provides a basic infrastructure for learning, especially imparting knowledge, without which schools and teachers and even parents would feel bewildered. It might be over-simplistic to argue that public examinations are a necessary evil, but ways might be found to explore the positive function of public assessments. The PISA exercises and reformed public examinations in Shanghai, Hong Kong and Singapore all provide experimental ground for using public examinations in a positive way to facilitate learning.

The question is how assessments and evaluations can be revised to monitor the output of education *as a system*, as well as ensuring the quality of student learning. For example, public examinations could be coupled with school-based assessments, one-off examinations could be augmented by comprehensive and time-sensitive student portfolios and so forth. Many such dimensions are being experimented with in many systems, Shanghai and Hong Kong included.

▪ Accountability

The term accountability is pervasive in the literature on education policies. Sometimes packaged as quality assurance, it is on every government's agenda. However, often people may have taken procedures of quality assurance as assurance of quality. This could be a gross misunderstanding. First, as noted above, defining quality and the standards we expect should precede methods for assuring this quality. In other words, if we set a rather low quality standard, any quality assurance mechanism will only assure low quality. Second, quality assurance works only in a culture that has internalised high quality as a norm. This is the only way that there will be active efforts towards and understanding of quality across the board.

Shanghai and Hong Kong both have social norms which value quality in education. First, both have systems of quality assurance in the managerial sense, as understood elsewhere. There is no shortage of performance indicators and appraisal mechanisms, and there is no phobia of such technicalities in these societies. Second, both education systems are basically transparent. Parents in these societies are not used to intervening in school activities as they do in many Western societies. However, parents have very powerful influence on schools, either through their choice of schools or through the media, which run constant reports on schools (often their discrepancies). 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. Dealing with the larger environment is not seen as an extra chore but as an integral part of professional responsibilities. This sense of accountability is built into programmes of teacher preparation, teachers' continuing professional development and training for school leadership. Hence, unlike in other cultures, accountability in Shanghai and Hong Kong is not regarded as a separate machinery to assure quality. Instead, accountability is built into the system as social expectations, as fundamental in school leadership, as well as an essential part of teachers professionalism. It is not about procedures and indicators.

FINAL OBSERVATIONS

China entered the global economy very late in the game, but has been making progress at breakneck speed ever since. It is hardly surprising that one can find almost everything somewhere in China, from examples of pre-industrial agricultural society to some of the most advanced industrial production sites in the world.

This chapter reflects this compressed development progression (see Chapter 1) in its account of the recent history of China's education system. The cultural background shared by the two case study societies no doubt explains elements of their common success. Yet both societies have been dissatisfied with some of the problems caused by that culture and both have sought to overcome them in their own ways. Both societies aim high and aspire to perform well in many areas of social development. Their ambitions are augmented by their prospering economic and financial sectors. However, both societies also regard human resources as the only resources they can rely on, and hence they have made substantial investments in education. This is a virtuous circle. Their spectacular reforms in education have made possible a no less spectacular economic success, which has in turn made it possible to continue to ratchet up the quality of their education systems. Their cultural heritage has played an important role in these successes, but that heritage has been constantly modernised.

In all these ways, the Chinese experience reflects the kind of progression in education development that appears to be taking place worldwide as the economy globalises, but the rate of these changes appears to be faster in China than in most other parts of the world.

■ Figure 4.3 ■

Shanghai-China and Hong Kong-China: Profile data

Language(s)	Official: Standard Mandarin (Shanghai) Standard Cantonese; English (Hong-Kong)
Population	1328 million (2008)[37] 12 million (2007)[38] (*Shanghai*) 6 977 million (2008)[39] (*Hong Kong*)
Youth population	20.5%[40] (OECD 18.7%; World 27.4%)
Elderly population	7.9%[41] (OECD 14.4%; World 7.4%)
Growth rate	0.63%[42] (OECD 0.68%; World 1.19%)
Foreign-born population	0.1% Immigrants (2010)[43]
GDP per capita	USD 5 962 (2008)[44] USD 11 361 (2009)[45] (*Shanghai*) USD 39 062 (2008)[46] (*Hong-Kong*)
Economy-Origin of GDP	Manufacturing, mining, utilities and construction 48.6%; Services 40.1%; Agriculture, forestry, fishing 11.3% (2008)[47] Manufacturing, auto making, chemical processing, steel manufacturing, biomedicine (*Shanghai*)[48] Manufacturing, finance, trade, other services, other sectors (*Hong Kong*)[49]
Unemployment	5.7%[50] (OECD average 6.1%)[51]
Expenditure on education	3.3% of GDP (OECD average 5.2%)[52] *3.3% of GDP* (*Hong Kong*)[53] 16.3% of total government expenditure (OECD average 13.3%)[54] *23% of total government expenditure* (*Hong Kong*)[55]
Enrolment ratio, early childhood education	44% (2008) (regional average 49%)[56]
Enrolment ratio, primary education	113% (2008) (regional average 110%)[57]
Enrolment ratio, secondary education	76% (2008) (regional average 77%)[58]
Enrolment ratio, tertiary[59] education	23%[60] (regional average missing)
Students in primary education, by type of institution or mode of enrolment[61]	Public: 93.8% (OECD average 89.6%) Government-dependent private: 6.2% (OECD average 8.1%) Independent, private (included in "Government-dependent private" figure) (OECD average 2.9%)
Students in lower secondary education, by type of institution or mode of enrolment[62]	Public 92.9% (OECD average 83.2%) Government-dependent private: 7.1% (OECD average 10.9%) Independent, private (included in "Government-dependent private" figure) (OECD average 3.5%)
Students in upper secondary education, by type of institution or mode of enrolment[63]	Public: 85.9% (OECD average 82%) Government-dependent private: 14.1% (OECD average 13.6%) Independent, private (included in "public" figure) (OECD average 5.5%)
Students in tertiary education, by type of institution or mode of enrolment[64]	Tertiary type B education: missing data[65] (OECD average public: 61.8% Government-dependent private : 19.2% Independent-private: 16.6%) Tertiary type A education: missing data[66] (OECD average Public: 77.1% Government-dependent private : 9.6% Independent-private: 15%)
Teachers' salaries	Average annual starting salary in lower secondary education: no data (OECD average USD 30 750)[67] Ratio of salary in lower secondary education after 15 years of experience (minimum training) to GDP per capita: no data (OECD average: 1.22)[68]
Upper secondary graduation rates	Data missing (OECD average 80%)[69]

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Interview partners (Shanghai)

Shanghai Academy of Educational Science

Lu Jing, Associate professor, Vice director, Shanghai Institute for Basic Education Research and Shanghai PISA Centre, Shanghai Academy of Educational Sciences.

Gu Ling-yuan, professor, master teacher, former vice director of Shanghai Academy of Educational Sciences. He was honoured Shanghai Education Hero in 2003.

Dr. Wang Jie, Associate Professor, Director of Teacher Education Centre, Shanghai Academy of Educational Sciences.

Interviews at China Pu Dong Cadre College

Shen Zu-yun, Director of Shanghai Educational News Centre.

Wang Mao-gong, Director of Education Bureau in Xuhui District, a central district in Shanghai.

Yin Hou-qin, Vice director general, Shanghai Municipal Education Commission.

Zhang Min-sheng, professor, Shanghai Education Society, former Vice Director General of Shanghai Municipal Education Commission.

Dr. *Zhang Min-xuan*, Professor, Vice Director General, Shanghai Municipal Education Commission, PGB and NPM of Shanghai PISA 2009.

Zhu Jian-wei, Director of Education Bureau in Minhang District, a suburb district in Shanghai.

Shanghai Teaching Research Institute

Tan Yi-bin, Assistant Director, master teacher, teaching researcher in Chinese, Shanghai Teaching Research Institute, Leading Expert of PISA 2009 Reading Expert Group in Shanghai.

Xu Dian-fang, Director, Shanghai Teaching Research Institute.

Teachers and Principals

Bai Bin, principal, Chinese teacher, Wen Lai Middle School, PISA School Co-ordinator in PISA 2009 Field Trial, which is held on April 25, 2008.

Ding Yi, Vice Principal, Middle School affiliated to Jing 'an Teacher Education College.

Li Xiao-yu, vice principal charges on teaching, Chinese teacher, Qibao High School.

Qiu Zhong-hai, Master teacher and master principal, Shanghai Qibao High School, he was honoured Shanghai Education Hero in 2008.

Shi Ju, mathematics teacher, Wen Lai Middle School.

Wang Hong, Chinese teacher, Wen Lai Middle School.

Xu Feng, vice principal, politics teacher, Wen Lai Middle School.

Mr Zhou. Vice Principal, Wen Lai High School.

Zhou Ming-jun, English teacher, Wen Lai Middle School.

(Hong Kong)

The material for the section on Hong Kong is based on the experience of Professor Kai-ming Cheng, Chair of Education, University of Hong Kong (1995 to present), Senior Advisor to the Vice-Chancellor, University of Hong Kong (2003 to present), and former Vice-Chancelor, University of Hong Kong 1997-2003.

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Notes

1. This section describes the general situation in mainland China. The set up in Hong Kong is different and is described in the section on Hong Kong.

2. See detailed discussions in Elman, 2000.

3. South Korea, Japan, Macao-China, Vietnam and North Korea, though not all of them have the same results.

4. In ancient China, the general understanding of the social hierarchy went from scholars (at the top), to farmers, then artisans and finally merchants.

5. "Massive" is defined by an enrolment ratio of over 25%. The enrolment ratio in 2009 was 23%, very near to the "massive" threshold.

6. Despite minor variations in parts of the nation, 6+3+3 is the basic pattern for primary, junior secondary and senior secondary schooling. Vocational schools of various types normally operate at the senior secondary level.

7. Gross enrolment ratio is used here because of age staggering at that level.

8. An 80% subsidy towards student unit costs from the central government in underdeveloped provinces, 60% for provinces of medium economies and no subsidy for developed provinces.

9. See more detailed discussion in Yang 2004.

10. This is the argument, for example, of Professor Weifang Min, the Party Secretary of Peking University and leading economist of education at the World Bank conference held in 2007 in Beijing.

11. The curriculum reform reduced a class period to 35 minutes for primary school and 40 minutes for secondary school in Shanghai. In most of the other provinces in China, a class period is 40 minutes for primary school and 45 minutes for secondary school (Ding, 2010).

12. This was due to the Nanking Sino-British Treaty of 1842, after China's defeat in the Opium War.

13. This is comparable with South Korea and Japan, where the number of places in higher education exceeds the number of high school graduates.

14. Institutes in Shanghai belong to different categories in terms of their relations with the central and municipal governments, with different degrees of sponsorship from the two authorities. Accordingly, they are assigned admission quotas of different mixes between local and national candidates.

15. To contain such education migrants, national stipulations require migrant children who attend basic education in the hosting city (*e.g.* Shanghai) to return to their places of origin for application to higher education institutions. In other words, they are not allowed to occupy a seat in the Shanghai quota.

16. The best presentation of this cultural assumption is by Fei Hsiao-tung, a student of Malinovsky and the first renowned anthropologist in China. According to Fei, society is perceived by the Chinese in a "hierarchical configuration" that is vertical and structured, as opposed to the Western view of society as an "association configuration" that is flat and *ad hoc*. This was best presented in the lecture series *Earthbound China* (1947).

17. This is also among the observations made by Stevenson and Stigler (1992).

18. This point was made succinctly by Mr Zhang Minsheng, former Director of the Education Commission of Shanghai, during a recent interview.

19. *Ibid.*

20. The following three sections are extracted and modified from a commissioned paper by Ding (2010).

21. See *http://wljy.sherc.net/kgpt/.*

22. This is a policy started in 2002, widely quoted. One of the most recent discussions can be found in Shao, 2010.

23. Interview with Gu Lingwan, former Deputy Director of the Shanghai Academy of Educational Research, a renowned teacher and reformer in mathematics education.

24. These are extracted and modified from Ding (2010).

25. *Ibid.*

26. Data from a group interview with good public school leaders.

27. This is from an interview with Mr Gu Lingyuan, a nationally famous mathematics teacher turned researcher, who is influential in education reforms in Shanghai.

28. USD 39 062 according to *OECD Economic Surveys: China 2010;* USD 42 748 (7th) according to International Monetary Fund; USD 43 957 (4th) according to the World Bank.

29. The gross enrolment ratio in 1965 was actually over 100%. This was due to the staggered ages at which children started school.

30. At this time Hong Kong's legal labour age was 14, one year less than the international norm of 15, so the city was barred from joining major trade treaties. The decision about nine-year compulsory education came almost overnight to rescue Hong Kong from this major trade crisis. See Cheng (1987).

31. The Society of Accountants' representative made the point that what had been taught in universities was not useful in the workplace, and hence graduates have to unlearn what they have learned. They'd rather they were not taught accounting, which they could learn on-the-job in a matter of months. The interview was carried out in 2000.

32. Including a special session with Dr Albert Tuijmann, then member of the OECD education team, in June 2000.

33. For the best summaries of these theories see Sawyer (2006) and Bransford *et al. (*2000).

34. This is a concept development by Foucault in his later years. A brief introduction to the concept can be found in *www.policyaddress.gov.hk/08-09/eng/policy.html.*

35. This is one of the main themes of the Chief Executive's Policy Speech in 2009 (Tsang, 2009).

36. South Korea launched a few reforms in the 1980s which went against the elitist tradition of calling for equalisation of secondary schools and mass admission to higher education. See Cheng 2010.

37. OECD (2010), *OECD Economic Surveys: China 2010,* OECD Publishing.

38. OECD (2010), *OECD Economic Surveys: China 2010,* OECD Publishing. Non-agricultural and total inhabitants (year of reference – 2007).

39. World Bank, World Development Indicators.

40. OECD (2010), *OECD Factbook 2010,* OECD Publishing. Ratio of population aged less than 15 to the total population (data from 2008).

41. OECD (2010), *OECD Factbook 2010,* OECD Publishing. Ratio of population aged 65 and older to the total population (data from 2008).

42. OECD (2010), *OECD Factbook 2010,* OECD Publishing. Annual population growth rate (data from 2007).

43. China is a sending country, with an estimated diaspora of 35 million worldwide (International Organisation for Migration, *www.iom.int*).

44. OECD (2010), *OECD Economic Surveys: China 2010,* OECD Publishing. PPP (data from 2008).

45. National Bureau of Statistics of China, *www.stats.gov.cn/english/.*

46. In current US dollars, derived from World Bank national accounts data, and OECD National Accounts data files. World Bank, World Development Indicators.

47. OECD (2010), *OECD Economic Surveys: China 2010,* OECD Publishing. Percentage of GDP 2008.

48. Shanghai municipal government.

49. Hong Kong Census and Statistics Department, *www.censtatd.gov.hk.*

50. OECD (2010), *Employment Outlook 2010,* OECD Publishing. Measured as a percentage of the estimated urban non-agricultural labour force (data from 2008).

51. OECD (2010), *OECD Factbook 2010,* OECD Publishing. Total unemployment rates as percentage of total labour force (data from 2008).

52. OECD (2010), *Education at a Glance 2010,* OECD Publishing (year of reference – 2007).

53. UIS Statistics in Brief: Hong Kong (China) SAR 2010 (year of reference – 2008).

54. OECD (2010), *Education at a Glance 2010,* OECD Publishing (year of reference – 2007).

55. UIS Statistics in Brief: Hong Kong (China) SAR 2010 (year of reference – 2008).

56. UNESCO-UIS (2010), *UIS Statistics in Brief: China.* Percentage represents gross enrolment rate for MF; 2008 (regional average 49%).

57. UNESCO-UIS (2010), *UIS Statistics in Brief: China*. Percentage represents gross enrolment rate for MF; 2008 (regional average 110%).

58. UNESCO-UIS (2010), *UIS Statistics in Brief: China*. Percentage represents gross enrolment rate for MF; 2008 (regional average 77%).

59. The OECD follows standard international conventions in using the term "tertiary education" to refer to all post-secondary programmes at ISCED levels 5B, 5A and 6, regardless of the institutions in which they are offered. OECD (2008), *Tertiary Education for the Knowledge Society: Volume 1*, OECD Publishing.

60. UNESCO-UIS (2010), *UIS Statistics in Brief: China*. Percentage represents gross enrolment rate for MF; 2008.

61. Data from UNESCO Institute for Statistics, Data from 2008, cited in OECD (2010) *Education at a Glance 2010,* OECD Publishing.

62. Data from UNESCO Institute for Statistics, Data from 2008, cited in OECD (2010) *Education at a Glance 2010,* OECD Publishing.

63. Data from UNESCO Institute for Statistics, Data from 2008, cited in OECD (2010) *Education at a Glance 2010,* OECD Publishing.

64. Data from UNESCO Institute for Statistics, Data from 2008, cited in OECD (2010) *Education at a Glance 2010,* OECD Publishing.

65. Data missing from *Education at a Glance 2009* (OECD, 2009).

66. Data missing from *Education at a Glance 2009* (OECD, 2009).

67. Starting salary/minimum training in USD adjusted for PPP, *Education at a Glance 2010* (OECD, 2010).

68. Starting salary/minimum training in USD adjusted for PPP, *Education at a Glance 2010* (OECD, 2010).

69. OECD (2010), *Education at a Glance 2010*, OECD Publishing. Sum of upper secondary graduation rates for a single year of age (year of reference for OECD average – 2008).

NATIONAL CENTER ON EDUCATION AND THE ECONOMY

CHINA: A STUDY IN PARADOXES

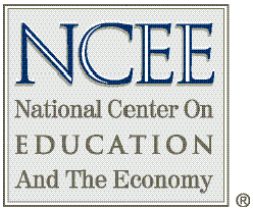
China: A Study in Paradoxes

A Preliminary Report

Mark Tucker

National Center on Education and the Economy

2005



China: A Study in Paradoxes[1]
A Preliminary Report

Years ago, when Deng Xiaoping took the reins of power in China, he concluded that there would probably not be a new world war and so decided that the country's leadership could safely make economic growth their primary goal. Deng then authorized some experiments in Guangdong Province that proved to be the entering wedge of the introduction of the market economy in that country, which of course led directly to China's explosive economic growth.

In recent years, our business press has been nearly obsessed with the dramatic rise of China, a natural consequence of the steady transfer of American manufacturing jobs to that country, the unprecedented and growing trade imbalance with China and the increasing American debt held by the Chinese.

In the early years of China's rise, many people assumed that, when everything was sorted out, China would end up being the world's factory for low value added products, but the West would continue to produce the high value added products and services that sustain high employment, high wage economies.

Over the last year or two, however, we have heard of more and more multinational firms transferring their R&D operations to China, and in the last few months, that giant semiconductor fabrication plants and hard disk manufacturing plants are being located there.

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[1] This is a preliminary report of field research done in China in October 2005 as part of an international comparative study conducted by the National Center on Education and the Economy. The team included Judy Codding, Mark Troppe, Barbara Rivard and the author for NCEE; Ben Vickery, of the National Institute for Standards and Technology and Yong Zhao, Distinguished Professor at Michigan State University. This research was supported by the Hewlett Foundation, The Bill and Melinda Gates Foundation, the Annie E. Casey Foundation and the National Center on Education and the Economy. This paper also draws on material gathered by Marc Tucker and Judy Codding during a number of earlier trips to China, two of which were sponsored by the Asia Society and the Chinese Ministry of Education.

At the same time, we have been reading reports that Chinese universities are turning out hundreds of thousands of capable engineers every year from their burgeoning university system, on the order of six to seven times the number of engineers produced every year in the United States. And we have heard, too, of a comparable increase in the number of new managers emerging from their new business schools.

No one was surprised to learn that the Chinese were unwilling to accept their assigned status as producer of low value added products for the world, while the west retained the right to produce the high value added products on which real wealth depends. What was surprising — and frightening — to many was the news that China might be well on the way toward building the kind of highly trained workforce that would enable it to run away with the grand prize: an economy that could corner the market on the whole range of manufactured products, including the most advanced that the world has to offer. It looked as though China might be creating an economy that could run on the slogan of high skills *and* low wages, thus putting it in a totally impregnable competitive position.

So five of us went to look. In two grueling weeks, we talked to over 200 people in government at every level, businesses, educational institutions and other institutions. We attended seminars, watched presentations, read the English-language newspapers daily, walked around factories, visited research parks, and sat in on classes. We talked at length with students at every level of the system. We got the official line and heard what the critics had to say. We read everything we could get our hands on.

We intend to collect more data, talk to more experts , and read many more reports and articles. So what follows is a very preliminary report. China is an enormous country undergoing tumultuous change. It is highly decentralized. The result is constant surprises. So we reserve the right to change our minds about almost anything as our research continues.

The Chinese economy and education system are two sides of one coin. All the way through, you will find a kind of on-the-one-hand-but-on-the-other-hand quality to this narrative. That accurately reflects our investigation and our intense conversations with each other as we ranged through Beijing, Shanghai, DongGuan, Shenzhen, and Hong Kong. One moment, China looks like a juggernaught and the next like Gulliver. So get ready for a bumpy ride.

Judging from the front pages of our press, China is the world's 800 pound economic gorilla. There are some respects in which this is true and others in which it is not. The next few paragraphs sum up a recent article in the Far Eastern Economic Review that will help us to keep things in perspective.

China's economy has been growing at a real rate of 9.5 percent for the last 25 years. Lately, Chinese exports have been growing at a rate of 20 percent a year. But China is still a poor country. Its per capita income is in the same range as that of Egypt, Syria and Paraguay. Its exports are still lower than those of Germany and the United States. And Japan, Germany, Canada, Ireland and Norway all run higher trade surpluses.

What is important about China's export profile is that it is highly concentrated in a few industries like electronics, electrical equipment, home appliances, garments, textiles and footwear. Because its share of world exports in these industries is as high as 50 percent, it is causing a great deal of unemployment among workers in these industries in those countries that used to dominate these industries, including the United States. The rise of some of these industries in China has taken place with lightening speed.

The impression we have is that everything we buy in these industries — from consumer electronics to refrigerators to the clothing on our backs — is now "Made in China." That is not so. That is what the label says, but the label is misleading. Many of the components are actually made in other parts of Asia and sent to China for final assembly. This is particularly true of the high value

added components. So it turns out that China's towering trade surplus with the United States is in large part offset by China's growing trade deficit with these other Asian countries. Stuff, in other words, that we used to buy directly from Thailand and South Korea and other Southeast Asian countries is now sold to China, and then resold to us as components of things that we buy from China. The margins on the assembly work that China does are often lower — sometimes much lower — than the margins on the work done by these other countries. The value of these other countries' exports to China has been increasing at an annual rate of 20 percent to 30 percent in recent years. When you look at the whole picture, the competitive threat from China is more modest than it at first seems, both because it is confined to a relatively short list of industries and because this 'workshop of the world' includes among its producers not just China, but many other countries of the Pacific rim as well.

And then there is the question of who exactly we are competing with. Deng Xiaoping's strategy for export-led growth relied heavily on attracting foreign firms to set up shop in China, drawn there by its low labor costs and investor-friendly policies. But one of the results is that, thus far, and in real contrast with India, few Chinese firms have been successfully launched on the world stage. Sixty percent of China's exports still come from foreign-invested enterprises. They typically do their R&D, design, component production, marketing, sales, logistics and distribution outside China. These offshore companies, many from the United States, typically make much more from Chinese exports than Chinese firms do, because the cutthroat environment of business in China leads to very small margins for Chinese firms.

Still, you might say, a 20 percent per year growth rate in exports is phenomenal, as is an overall growth rate of 9.5 percent, year after year after year. Won't China's very low labor costs and its inexhaustible supply of labor ultimately enable it to deal a devastating blow to the American way of life as it gradually comes to dominate industry after industry? And what, you might ask, is to prevent the Chinese from doing their own R&D, logistics, supply chain

management, design and all the rest of the high value added jobs in the economy?

The answer, it turns out, has to do with human resources. The manufacturers we talked to told us that they were having a hard time finding engineers who could do what international firms expect them to do and they were in a state of full-fledged panic when the subject turned to finding competent managers. The best engineering graduates of the leading Chinese universities are not available; they typically head for jobs in the advanced industrial countries. Because most Chinese engineering schools don't have the kind of budgets they need for equipment, and because Chinese education traditions value theory over practical applications, Chinese engineers frequently come to the job never having laid an eye on the kind of equipment they are expected to use. One employer told us that engineers coming into the printing industry were trained on a cardboard cutout of a Heidelberg press (still the industry standard), because their school could not afford to buy the real thing.

There are over 2,000 universities in China. Of these, 100 have been designated national research universities. Of these, the top 31 are intended to be world class. The business executives we talked with said that many graduates of the top 10 went abroad, and few below the top 31 were qualified to work in international firms. This imposes a real constraint on the growth of Chinese industry. Despite an annual production of hundreds of thousands of engineers, the Cherry Automotive company of China, the country's largest automotive company, is reportedly importing engineers from the United States.

But that is not the most important constraint, even from a human resource point of view. The biggest problem is managers. Many foreign-owned firms set up shop in China with business plans that called for starting with a cadre of expats as senior managers, to be replaced with Chinese, at a much lower cost, within two or three years. It is not working out that way. The highest status in the Chinese system goes to engineers and scientists. Managers are much further

down the totem pole. So only those young people who cannot get into engineering programs go into the management schools.

China has a very authoritarian culture . This comes in part from its Confucian roots, which place a very high value on veneration of one's parents and ancestors and on respect for those in authority, and in part from the Communist government. Though the Communist government has embraced capitalism with enormous enthusiasm, it has not given up its control of Chinese society. To take one important example, the party officials in the universities, not their presidents and provosts, have the last word on who gets hired, including into professorial posts. People who seem likely to take an independent line on anything the Party cares about will not be hired, and those who have been careful to curry favor with the Party officials in the university are more equal than others when positions are filled. Thus economists who have explanations for economic behavior that do not fully accord with Marxism-Leninism need not apply. In these and many other ways, those with ideas in many other fields that do not conform to the orthodox are weeded out and almost everyone learns from an early age that conformity pays.

One consequence is that Chinese managers tend not to show much initiative, defer to their superiors whether or not their superiors are worthy of deference, and wait around to be told what to do. Education generally is not very hands on and Chinese management schools, unlike American ones, do not require that entering students have some actual management experience. So graduates of these schools come to work not knowing much and waiting around to be told what to do and how to do it. This may be a caricature, but it was told to us so often by the business executives with whom we talked, that we came to believe that there is more than an element of truth to it.

Because capable managers are in short supply, it is a sellers' market. Incumbents are always looking for their next job. The typical tour is two years or less before departure for the next job. It is not uncommon for capable people to get offers to double their salary on the spot. The result is that foreign-capital firms are paying

native Chinese managers with the right skills and experience as much as they paid expats to do the same work.

This problem, combined with the swiftly escalating costs of land in the coastal provinces and rising costs of commodities on the world market, is driving up the cost of doing business in those provinces very quickly. In Tianjin, the "Diamond of the Bohai Gulf," a major industrial and port city near Beijing, the fully loaded labor costs are twice what they are in other parts of Southeast Asia. Investors continue to come to China because of the enormous internal market, modern deepwater ports, good infrastructure, excellent logistics and generally supportive government officials. In time, this closing of the gap between the cost of doing business there and in the West will make China less of a threat to the rest of the world. In the meantime, the problem of finding engineers who can meet international standards, and, particularly, the challenge in finding capable managers, will impose real limitations on the continued growth of Chinese enterprises.

Or maybe not. One possible solution to at least some of the problems I have just described seems to be emerging in the form of what might be called the superregionalization of the Chinese economy. Up to now, Beijing's policy seems to have been to set every jurisdiction in China into competition with every other one. But that is now changing.

One of several examples of superregionalization is the case of the Pearl River Delta. Hong Kong island sits just south of several other islands that, in turn, lie just to the south of a vast region through which the Pearl River and its associated tributaries and offshoots drain. The cities and provinces in this region, including the Hong Kong special administrative region, recently joined together, with the active encouragement of Beijing, to promote the economic growth of the region. The concept, as related to us by top Hong Kong officials, is for Hong Kong to become the 'brains' of the region, with the other provinces supplying the brawn This is a very powerful idea. It has been very difficult, up to now, for foreign firms to do business here because, among other reasons, the mainland Chinese

believe that the negotiations should begin when the contract is signed, not before; because there are a bewildering array of potential suppliers and it is very hard to assess their capabilities and because the mainland Chinese, notwithstanding the provisions of the WTO treaty, have very little regard for copyright restrictions. And then there are all the problems of getting quality management and other professional staff mentioned above.

But Hong Kong is full of very capable managers, understands international finance, is in a position to assess the capabilities of mainland suppliers, will stand by a contract, respects intellectual property rights (more so, at least, than the mainland) and so on. Hong Kong, in other words, is in a good position to provide the high value added business services that are in such short supply on the mainland. Properly married to the extraordinary resources of the mainland, the combination could be dynamite. Or at least that is the theory, still to be tested.

Please note, the size of the population whose governments are signatories to the regional treaty just described is somewhat larger than that of all of Europe! And there are several other conurbations of coastal provinces that have much the same potential as the Pearl River Basin.

It is not unimportant to note that we have never seen anything to equal the sheer determination and energy of the Chinese with respect to economic growth. Whether or not superregionalization ends up defining the future path of Chinese development, this determination will be a force to contend with. When the government in Beijing understood that competitiveness in many countries, especially in Europe, would depend on meeting international quality standards, it simply mandated compliance with those standards on the part of its companies producing for export. When QuangDong's leadership saw that its firms could not compete for labor with the provinces in the interior, it mandated a 17 percent increase in wages. Little wonder that more than 80 percent of the refrigerators sold in the United States are manufactured in Quangdong.

There is much more to be said about the Chinese economic challenge, and we hope to say it in a longer paper to be written on the subject, but it is time to expand on the subject of education and training in China, from the perspective of their contribution to the nation's modernization.

One can only begin by commenting on the Herculean effort that China has made to extend compulsory schooling through nine years, improve school attendance in the compulsory years and reduce illiteracy in the working age population. The proportions by which these gaps have been closed, combined with the numbers of individuals affected, even if one is quite skeptical of government claims, is breathtaking.

One must remember, too, that in the late 60s and up to the mid-60s, during the cultural revolution, universities everywhere were closed down. Many faculty hid out in the mountains; many others were sent to the countryside to work doing manual labor. In 1978, when the cultural revolution was over, university faculty slowly returned from the countryside to reclaim their campuses and started to rebuild their shattered institutions. Even as recently as 1993, university faculty could be found living at the end of muddy unpaved roads in dormitories with leaking roofs, with communal toilets and kitchens in the common hallways, working for the equivalent of $100 US a year.

Deng Xiaoping, who was deputy premier during the cultural revolution, became the power behind the throne afterwards. It was Deng who played the key role in opening China to the West. For Deng, the key to China's future lay in economic growth and the key to economic growth lay in education, science and technology. The challenge he faced was how to jump start a nation that was very far behind the West and whose intellectual resources had been largely destroyed by the cultural revolution. His strategy for addressing this challenge was to arrange a massive transfer of intellectual capital from West to East, The first step occurred in the late 70s, when he began sending people abroad in large numbers to be educated. It is estimated that some 80 percent of the current top leadership of China, right down to department heads, was educated in the West,

preeminently in the United States. And, just as Deng hoped, they brought back Western ideas when they returned. It is arguably the case that one of China's biggest and most important educational revolutions took place right here in the United States.

Later, as Deng found the money to invest in the development of higher education in China, he embarked on round two of his program of intellectual transfer; he insisted that Chinese universities establish units in the office of the president of those universities with the express purpose of fostering serious, long terms exchanges and partnerships with major Western universities. This was a natural extension of his initial strategy to jump start the Chinese education system by directly accessing the best intellectual resources in the West.

In time, Deng set a goal of building 100 research universities in China, each of which would have at least one department or discipline regarded as world class. Later, his protégé, Jiang Zemin, established the goal of having a smaller number (now 31) of universities of the first rank. Of those 31, two, both in Beijing, have been designated as the best in the nation and receive the highest levels of investment.

But all university systems are no better than the systems of primary and secondary schools that supply their students. So what can we say about China's schools?

I begin with the observation that Hong Kong scored among the top four countries in the recent PISA (OECD) international comparisons of educational achievement in mathematics as well as in problem-solving. Mainland China has not thus far agreed to participate in PISA (we are told this is because of the poor performance they expect from their rural provinces), but the people in Hong Kong in a position to know thought that mainland Chinese children would score even higher in mathematics than the Hong Kong children did. The limited data that are available from the Stevenson-Stigler study suggest that this might in fact be true.

That is, of course, just plain extraordinary for a very poor country. There are two reasons for it. The first reason is the very intense pressure on Chinese children to do well in mathematics (a subject to which I will return in a moment). The second is the high quality of mathematics teaching in their schools. The quality of mathematics teaching in China is not news. Jim Stigler, Harold Stevenson and Liping Ma have written eloquently on this subject over the last several years. The essence of the story has to do with the heavy emphasis on early and continual mastery of the key conceptual foundations of mathematics. In a nutshell, the Chinese end up understanding how and why the mathematics works while our students are learning to do the operations with little understanding.

The part of the story that has not been widely reported has to do with the extraordinary pressure that Chinese students are under to learn mathematics. This story actually begins in the Chinese universities. These universities are finely graded by status by the Chinese Ministry of Education. Every year, students in Chinese high schools who want to go to university take the entrance examinations given by the central government and the provinces. All students must take exams in Chinese, English and mathematics. The score on the mathematics part of the university entrance exam counts for not less then 25% of the total score, whether that students wants to study engineering or music. Each university is allocated a certain number of slots by the Ministry of Education. The candidates are sorted by their scores on the exams. Thus the students with the highest scores are allocated to the universities at the top of the status hierarchy and then within the university by the status of the department within the university (so Peking University gets higher scoring applicants than almost all other universities and the school of engineering gets higher scoring students than the school of management.).

So, voila! Performance on the mathematics exam turns out to be one of the most important factors in determining a student's future, irrespective of what that student might want to do in life. Only the score on the exam matters. Students

are not interviewed, nor are their extracurricular activities taken into account. No one cares whether they demonstrated leadership or have had experiences that might make them better people. Nothing else matters. Little wonder that every student in every school at every level works like blazes to do as well as possible in math.

When I say, "works like blazes," I mean exactly that. Many primary and secondary school students in China are boarding students. Their day begins at 7:30 in the morning and runs until the late afternoon, with an average of three hours of homework at night. By our rough count, corroborated by observers who know both countries well, Chinese secondary students typically spend twice as many hours a year studying as American students do. And it is not just time. We interviewed secondary school students wherever we could, and a large fraction reported very, very high anxiety about their exams, especially their mathematics exams. They clearly work very hard at mastering the material.

The exam itself is designed for sorting, not for finding out whether the student has learned the kind of math that might be useful to him or her. Many prompts are actually trick questions, designed to trip up the unwary and often require knowledge of some abstruse, obscure point that would rarely be used by a student during the rest of his or her life.

We interviewed a very impressive dean of an engineering department at one of China's leading universities who told us that his department had applied to the Ministry for permission to change the admission standards for his department. He and his colleagues wanted to be able to find out whether applicants were likely to have leadership abilities, could think out of the box, could work effectively in groups, use their engineering knowledge to solve unexpected problems — all qualities that their customers, domestic and foreign firms, had told them that they badly needed. The Ministry turned them down.

Why? The people we interviewed in the Ministry know that the exams are flawed and they know that China badly needs the very kind of qualities that this

dean and his colleagues wanted to sort for. But the exam enjoys overwhelming support from Chinese in all walks of life. This is because, in a highly corrupt system, the exam seems to many to be the last redoubt of objectivity and merit.

It is, by the way, possible for the authorities to jigger the exam results to a degree to accommodate party officials and other powerful people, but, on the whole, the extent of such corruption is small compared to the corruption in other parts of the education system. What do I mean by corrupt? Almost all the students in the top 100 universities in China are products of the "key" high schools. These elite schools are designated by the provinces and cities, just as the "Key" universities are designated by the Chinese Ministry of Education. Elite universities and elite high schools are designed for extra state investment. But they are also permitted to set aside a certain proportion of slots and use them to enroll students who do not meet the entrance standards they have for regularly enrolled students. These slots are allocated to students whose parents are prepared to pay substantial tuition charges. The lower the student's score on the high school entrance exams, the higher the tuition charge. Thus these schools are, in American terms, a combination of public and private school. In some schools, the charges for the tuition paying students have permitted these schools to build up very large endowments, build very expensive buildings and pay their teachers much more than teachers are paid in the regular state schools. In this situation, it is easy to see why parents who could not pay such charges are afraid that if there were no exam, their students would not stand a chance of going to good schools no matter how strong their record was.

In many of the same schools, students who do not need any tutoring are tutored nonetheless, because their teachers, who make additional income by tutoring, are known to deny needed opportunities to students who refuse to get tutored. This not so subtle form of blackmail is apparently endemic in the better schools and provides even more reason for parents to believe that the exams are a vital bulwark of fairness in their education system.

The Ministry of Education and the top officials in the big city systems will tell you that there are no "key" or elite primary or junior middle schools. But everyone else will tell you that they are alive and well, despite official discouragement, because the provincial and local officials find it in their interest to give extra funding to the schools in which they have a right to enroll their own children. They may not be called key schools, but they walk and talk like key schools.

Though ordinary Chinese schools are public, that does not mean that they are free. Tuition is charged virtually all students, in addition to a wide range of other fees. These charges and fees represent a very heavy burden for poor rural families, which is why many rural families do not send their daughters to school after the first few years, despite the requirements of the compulsory education law. The tuition and fees are voted and collected by the — typically unelected — village councils, who often stuff the schools with incompetent relatives and supporters, thus increasing the tax load on the farmers and foisting incompetent teachers on their children. This system accounts for some measure of the simmering resentment in the countryside.

These comments about tuition in public schools lead to another point. Whatever rights a Chinese student has to an education in the public schools is limited to the province or city in which their parents are registered. The children of migrant workers (that is, workers who migrate from the interior of China to the wealthy coastal provinces in search of work), of which there are now vast numbers in China, do not have the right to go the public schools in the provinces or cities to which their parents have gone to work. Any education they do get they must pay for in full. Thus private education in China is mainly education for the very poor. Its cost, if they choose to pay it, is often a very large fraction of their incomes, and the schooling is typically of very low quality. There are exceptions to this rule. Provinces and cities can choose to turn immigrants into citizens, but this right is typically awarded only to government workers and other relatively well educated (and therefore upper class) people who are invited into the province or city to fill professional positions in the workforce. As much

as fifty percent or more of the population of some of the coastal provinces is made up of such migrant workers and their families, and these restrictions on their rights has the same potential for social dynamite as we have seen among the second and third generation guest workers in France and other European countries.

Some observers describe Chinese classrooms as brutal, places where students are bullied and yelled at by their teachers. We did not see any of that. What we did see is a curious — for us — blend of a very demanding classroom manner on the part of teachers combined with an embracing pastoral care. Teachers expect a lot in class and make those expectations very clear. But, as the same time, the school staff, particularly in the boarding schools, readily accept a responsibility to support their wards in all the dimension of their personal, moral and physical development. Whereas our teachers are accustomed to a very sharp line between their responsibilities and those of the students' parents, in China school staff see themselves having personal responsibility for the development of the whole child. We saw this everywhere, but nowhere more than in the boarding schools, where the faculty is responsible for the students 24 hours a day.

But all of this is in the context of a very authoritarian environment. I pointed out above that Confucius strongly emphasized the responsibility of children to obey and venerate their parents and of adults to acknowledge and accede to the authority of the state. However much the Communist state may have hated religion, it nevertheless created an environment in which it could be and often was fatal to challenge authority. The results can be seen not just in the universities, but also in the primary and secondary schools.
Everywhere we visited schools in mainland China, students made very impressive performances for us, but often, when questioned on their performances, were unable to talk about them in a way that convinced us that they understood what they had read, could think independently about it, or were willing or able to challenge the version of reality with which they had been presented. Very often, we discovered that the performance we had seen and

heard had been memorized by students who were at sea when asked to do anything other than recite.

So we ended up with something of a paradox. The Chinese may well be producing the most mathematically adept population in the world, and therefore have the potential for producing the world's most capable workforce anywhere in the vital fields of science, mathematics and engineering, But, at the same time, they have a culture and an education system that may make it singularly difficult for them to cultivate the creative, innovative and entrepreneurial abilities that may prove most important to economic success in high wage societies in the future.

The Chinese are very aware of this paradox and determined to do something about it. And they may have the means. I have been careful to refer here to mainland China. If you were to construct a dimension line extending from mainland China to the United States on the variables I have been discussing, you might want to place Hong Kong halfway between the two. We got plenty of stiff, memorized performances from Hong Kong students, too. But when we asked the Hong Kong students to talk about what they had said in their presentations, they had no trouble doing that. Hong Kong is busy revising its curriculum and changing its exams to take account of the problems we have described on the mainland, without lowering their standards. The Hong Kong authorities have studied the West very carefully and are determined to get the best of the West without giving up any of what they value most in their own culture and traditions.

If Hong Kong succeeds in its alliance with the mainland Chinese provinces bordering on the Pearl River Delta, its education system could provide the kind of intellectual and managerial leadership that the alliance will need for the next stage of development. Over time, the other provinces could adopt many of the educational policies and practices that have enabled Hong Kong to join the ranks of the most highly developed societies in the world.

All through our most recent visit to China and after, our team furiously debated whether the glass was half empty or half full — whether the problems we saw would prevent China from rising to the economic front rank among nations or whether China was likely to overcome those problems to do exactly that.

The progressive educators among us were very put off by the intense anxiety among the very large fraction of the secondary school students who lived in daily fear of shaming their parents by poor performance on the exams, the deflated attitudes of the students in the ordinary secondary schools who had given up because they had not managed to get into a secondary school that could get their students into university, the crushing inequities of a system in which wealthy "key" schools existed literally right across the street from impoverished ordinary schools at the same level, the appalling unfairness of the system that prevents the children of migrant workers from gaining access to the public schools, the rampant corruption of system in which places in good schools were sold to the wealthy parents who could afford them, and the lack of anything approaching real academic freedom in the universities, to say nothing of engineers trained to operate cardboard cutout models of the equipment they were supposed to be able to operate, university hiring decisions being routinely made by political operatives, and systematic underinvestment by the authorities in the education system as a whole.

But, at the same time, we had to acknowledge that astounding advances had been made in a very short time in school attendance rates and adult literacy, universities and research parks were being constructed and put in operation at dizzying rates on an enormous scale, mathematics achievement was remarkable and the production of engineers far outstripped the rate in the United States.

It is all too easy to be smug when viewing China from a Western perspective. But China has a way of holding up the mirror to our own country. Which of us would profess to be shocked when told that school district payrolls in this country are often stuffed with incompetents who just happen to be relatives or supporters of people on the school board? Or that very wealthy (ostensibly

public) schools accessible only to the children of the very wealthy families that can afford to live in those communities exist only a few miles from very poorly equipped and staffed schools serving only the very poor? Or that many students in our system whose parents expect them to attend the best private universities in the land are driven by the same anxieties that drive the best Chinese students? Who is to say which is worse — a system that expects very little of most students and so puts very little pressure on them or a system that expects much and puts much more pressure on them?

Most of the problems we saw in the Chinese education system are problems that the Ministry has acknowledged and is trying to solve. They want their students to be more independent, to be able to apply what they have learned to real world problems, to be more creative. They want to put an end to rote learning and promote problem solving and critical thinking. They are very worried about the inequities in their system, particularly for the rural schools in the interior and the children of the migrant workers in the coastal cities, and are trying to redirect resources to address them. They want to build a more effective vocational education system. And they want to eliminate the defacto system of favored elite primary and lower secondary schools.

These are all daunting challenges. But, given the Chinese record of success over the last three decades, one would be foolish to bet against them. The most serious issues, though, are not on this list. They have to do with the deeply rooted nature of the authoritarian system in China, briefly discussed above. It is precisely that high regard for authority that has enabled China to make such striking progress on such an enormous scale. But it is that very set of values and its influence on individual behavior that may constitute China's greatest obstacle to success in the years ahead.

Whatever happens, there is already much that we can learn from this dynamic country. Not the least of that learning comes from the light that China shines on the choices that we have made in our own economy and our own education system.

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CATCHING UP: LEARNING FROM THE BEST SCHOOL SYSTEMS IN EAST ASIA

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Catching up:

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Ben Jensen

Summary report

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Overview

Today's centre of high performance in school education is East Asia. Four of the world's five highest-performing systems are Hong Kong, Korea, Shanghai and Singapore, according to the OECD's 2009 PISA assessments of students. In Shanghai, the average 15-year old mathematics student is performing at a level two to three years above his or her counterpart in Australia, the USA, the UK and Europe.

In recent years, many OECD countries have substantially increased education expenditure, often with disappointing results. Between 2000 and 2008, average expenditure per student rose by 34% across the OECD. Large increases in expenditure have also occurred in Australia, yet student performance has fallen.

The global economic crisis demands budget cuts. Yet education performance is vital to economic growth. As the world's economic centre shifts to the East, there is scope to learn from its most effective school systems to improve our children's lives.

Success in high-performing systems is not always the result of spending more money. Korea, for example, spends less per student than the OECD average. Nor is success culturally determined, a product of Confucianism, rote learning or Tiger Mothers. Only 11 years ago, Hong Kong ranked 17th in assessments of reading literacy (PIRLS) and Singapore was ranked 15th. Just five years later (in 2006) they ranked 2nd and 4th.

The report does not claim that the political and policymaking structures of East Asia can or should be reproduced elsewhere. Each country has to tailor reform to its own system and culture.

However, these four systems all focus on the things that are known to matter in the classroom, including a relentless, practical focus on learning, and the creation of a strong culture of teacher education, research, collaboration, mentoring, feedback and sustained professional development. These are precisely the reforms that Australia and other western countries are trying to embed. Yet there is often a disconnect between the objective of policies and their impact in classrooms. The four East Asian systems have found ways to connect high-level strategy to what others have been trying to achieve in the classroom.

The role of teachers is essential: they are partners in reform. In Singapore, they are paid civil servants during their initial teacher education. In Korea they must pass entrance examinations, including classroom demonstrations, before becoming teachers. In Shanghai, all teachers have mentors. New teachers have district-based mentors and two in-school mentors (one on classroom management, the other on subject content). In Hong Kong, classroom observations aim to change teacher culture and improve pedagogy. The focus is on openness to new ideas and career-long teacher learning. These four systems are not afraid to make difficult trade-offs to achieve their goals. Shanghai, for example, has larger class sizes to give teachers more time for school-based research to improve learning and teaching.

These systems are neither perfect nor universally popular. Hong Kong acknowledges that its move away from a strict examination focus has not yet persuaded most parents. Yet many countries are trying to emulate the success of these systems. Most have further to go. This report shows in detail how it can be done.

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Figures, Tables and Boxes

Figures

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Boxes

1. How we wrote this report, how to read it

In September, 2011, Grattan Institute, in association with Asialink, the Asia Education Foundation and the Victorian Department of Education and Early Childhood Development, brought together educators from Australia and four of the world's top five school systems: Hong Kong, Shanghai, Korea and Singapore. The 'Learning from the Best Roundtable', attended by the Prime Minister, Julia Gillard, and the Federal Minister for School Education, Early Childhood and Youth, Peter Garrett, sought to analyse the success of high-performing systems in East Asia, and what practical lessons it provided for Australia and other countries.

Following the Roundtable, researchers from Grattan Institute visited the four high-performing education systems in East Asia. They met educators, government officials, school principals, teachers and researchers. They collected extensive documentation at central, district and school levels. Grattan Institute has used this field research and the lessons taken from the Roundtable to write this report.

This Summary report examines how Hong Kong, Shanghai, Korea and Singapore designed and delivered their policies and programs. The Full report provides substantially more information on the design and implementation of the programs that underpin success.

In the Summary report, Chapter 2 examines the main features of high-performing education systems in East Asia, while Chapter 3 considers why their performance has risen so sharply in recent years, and why it has not in most other OECD countries.

Chapter 4 discusses effective teaching and learning and explains why each education system must arrive at its own definition of these concepts. Chapter 5 considers key steps in successful education reform, and Chapter 6 looks at best practice: how such a strategy was defined and executed in Hong Kong.

Chapters 7 to 12 examine six policy areas and programs – in initial teacher education, school principal education, induction and mentoring, research and lesson groups, classroom observation and teacher career structures – that have been integral to the success of one or more of the four high-performing education systems in East Asia.

No country can import another's culture, but these six programs have been the focus of reform in many systems throughout the world. Reform in high-performing systems in East Asia has an unrelenting focus on improving student learning. An objective to which all school systems aspire.

While the findings of the Summary report should interest all people with a stake in education, we also hope the extensive material on education reform, design and implementation of programs in the Full report will assist educators and policymakers undertaking the task of designing and executing school education reform.

Box 1.1: Learning from the Best - a Grattan Institute Roundtable on High-Performing Systems in East Asia

Grattan Institute, in association with Asialink, the Asia Education Foundation and the Victorian Department of Education and Early Childhood Development, convened a Roundtable on 27-28 September 2011 in Melbourne, Australia to learn from high-performing education systems in East Asia. The Roundtable was attended by:

- The Prime Minister of Australia, The Hon. Julia Gillard MP;
- Australia's Federal Minister for School Education, Early Childhood and Youth, The Hon. Peter Garrett AM, MP;
- Professor Cheng Kai-Ming, Chair Professor of Education, the University of Hong Kong, Hong Kong Special Administrative Region;
- Dr Andreas Schleicher, Special Advisor on Education Policy to the OECD Secretary-General and Deputy Director, OECD Directorate for Education;
- Dr Shin Hye-Sook, Research Fellow, Korean Educational Development Institute;
- Professor Tan Oon-Seng, Dean, Teacher Education, National Institute of Education, Singapore;
- Dr Yu Hyun-sook, Director-General, Korean Educational Development Institute;
- Dr Zhang Minxuan, President, Shanghai Normal University;
- Prof Yong Zhao, Presidential Chair and Associate Dean, Department of Educational Methodology, Policy and Leadership, University of Oregon;
- Secretaries/Directors General of Education throughout Australia.
- *Roundtable Chairs*: Ben Jensen (Grattan Institute) and Tony Mackay (Asia Education Foundation).

Four research partners significantly contributed to the Roundtable: Centre for Public Education, Hay Group, KPMG, and Social Ventures Australia.

The Roundtable was presented in association with Asialink and Asia Education Foundation, and the Department of Education and Early Childhood Development, State Government of Victoria.

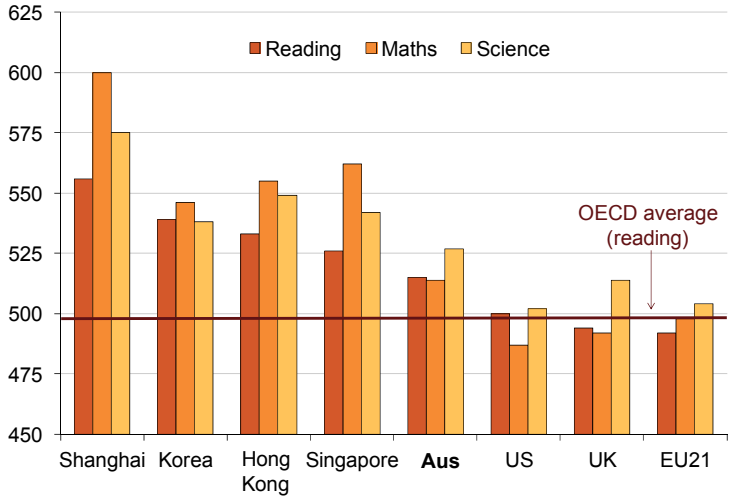
For a full list of participants see Appendix A.

2. East Asian success: high performance, high equity

The latest OECD PISA results show that four of the world's five top performing school systems are Hong Kong, Korea, Singapore and Shanghai (see Figure 1).

In Shanghai, the average 15-year old mathematics student is performing at a level two to three years, on average, above his or her counterpart in Australia, the US, the UK and EU21 countries.[1]

Figure 1: PISA mean scores for reading, maths and science (2009)



Source: OECD (2010b)

Korean students are at least a year ahead, on average, of USA and EU students and seven months ahead of Australian students in reading. Hong Kong and Singaporean students are at least a year ahead, on average, of the USA and EU students in science (see Figure 2).

Figure 2: How many months behind? Differences in PISA performance (2009)

	US			UK			EU21*			Australia		
	Read	Math.	Sci.	Read	Math.	Sci.	Read	Math.	Sci.	Read	Math.	Sci.
Shanghai	17	33	23	19	32	19	20	30	23	13	25	15
Hong Kong	10	20	15	12	18	11	13	17	14	6	12	7
Singapore	8	22	13	10	20	9	10	19	12	3	14	5
Korea	12	17	11	14	16	8	14	14	11	7	9	3

< 1 year behind | 1 to 2 years behind | > 2 years behind

Notes: ** Unweighted average. Figures represent the difference in PISA 2009 performance expressed in the number of months of school education. One school year corresponds to 39 points in reading, 41 points in maths and 38 points in science, on average, across OECD countries on the PISA scale.*

Source: PISA 2009 data from OECD (2010b), conversion rate of PISA points to OECD education months from Thomson, et al. (2010)

[1] This should be interpreted as two to three 'OECD years' of school education. PISA points have been converted to education months, on average, across OECD countries on the PISA mathematics scale, using conversation rates sourced from Thomson, *et al.* (2010)

Box 2.1: How are students assessed in PISA?

The OECD's Programme for International School Assessment (PISA) is a series of extensive and rigorous international surveys to assess the knowledge and skills of 15 year-olds. More than 70 countries participated in the most recent round of assessment.

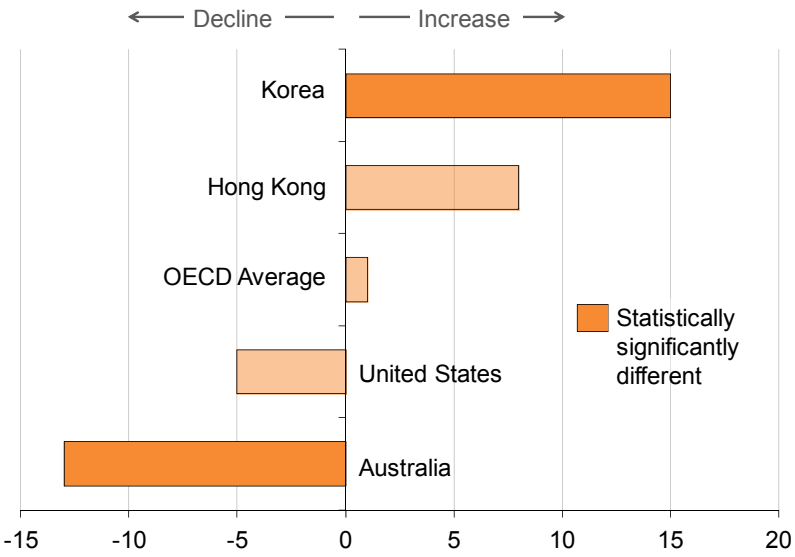
PISA tests are designed to capture how well students are equipped to apply academic skills in real-world situations. "The emphasis is on mastering processes, understanding concepts and functioning in various contexts."[2] Students are asked to compose long-form answers, as well as answer multiple-choice questions. Both parts assess problem-solving skills.

2.1.1 High performance that keeps improving

Improvement in high-performing education systems in East Asia has been rapid (see Figure 3). For example:

- Between 2000 and 2009, Korea's mean reading score improved by 15 points (equivalent to nearly five months learning), on top of decades of improvement. Hong Kong improved by eight points.
- Shanghai and Singapore participated in PISA for the first time in 2009 and ranked 1st and 5th in mean reading scores of countries tested.[3]
- As recently as 2001, Hong Kong was ranked 17th in international assessments of reading literacy (PIRLS) and Singapore was ranked 15th. In 2006, they were ranked 2nd and 4th respectively.[4]

Figure 3:Change in PISA mean reading scores (2000-2009)



Source: OECD (2010a)

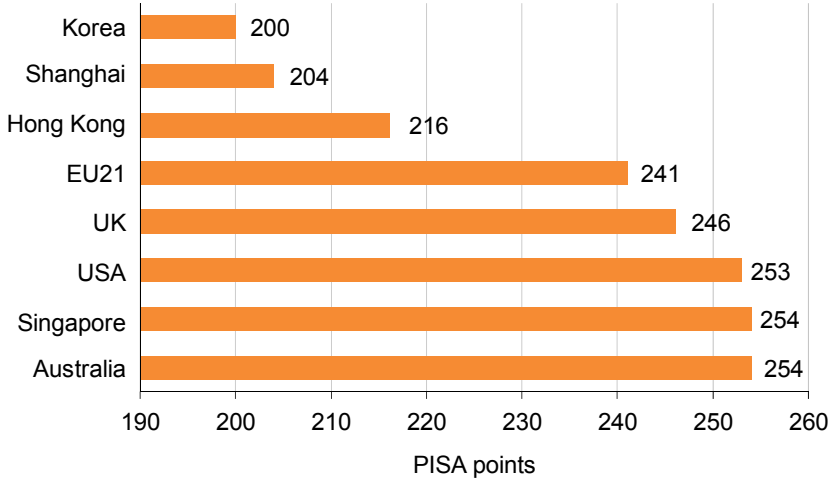
[2] OECD (2010b)
[3] Ibid.
[4] Mullis, *et al.* (2007)

2.1.2 High levels of equity

High-performing education systems in East Asia have successfully increased performance while maintaining, and often increasing, equity. Compared to Australia and most OECD countries, a child from a poorer background in these systems is less likely to drop out or fall behind.[5]

Figure 4 shows that there is less of a gap between high and low performing students in Korea, Shanghai and Hong Kong compared to many other OECD education systems.

Figure 4: Low and high performing students: the difference between bottom 10% and top 10% (PISA 2009 - reading)



Source: OECD (2010b)

[5] OECD (2010b)

Low performing students are also better prepared for their future. The bottom 10% of maths students in Shanghai perform at a level that is 21 months ahead of the bottom 10% of students in Australia. This gap rises to 24 months in the UK, 25 across the average of the OECD, and 28 months in the USA.[6]

2.1.3 High Participation

Increasing performance and equity has been achieved with high and increasing participation. For example, 30 years ago about 40% of young Koreans (aged 25-34) finished secondary education. Now the figure is 98%, ten percentage points above the OECD average.[7]

2.1.4 High Efficiency

The world's best school systems are rarely the world's biggest spenders.[8] Korea spends much less per student than other education systems, yet achieves far better student performance (see Table 1 below).

[6] Ibid.
[7] OECD (2011)
[8] Hanushek and Raymond (2004)

Many systems continue to increase expenditure with little impact. Australian school expenditure has increased dramatically. Between 2000 and 2009, real expenditure on education increased by 44%.[9] The average cost of non-government school fees rose by 25%.[10] Despite these increases, Australia was only one of four countries that recorded a statistically significant decrease in PISA reading scores from 2000 to 2009.[11]

Table 1: Annual expenditure per student in selected OECD countries (2008)

	Primary (USD)	Secondary USD)
OECD average	7,153	8,972
Australia	6,723	9,052
Korea	5,420	7,931
United Kingdom	8,758	9,487
United States	9,982	12,097
EU19 average	6,479	8,116

Notes: Figures are expressed in equivalent USD converted using PPPs for GDP, by level of education and type of service, based on full-time equivalents for educational institutions on core services, ancillary services and R&D.

Source: OECD (2011)

[9] Combines real schooling expenditure for State and Territory and Commonwealth governments. MCEETYA (2001) Figure 3.1; ACARA (2009) Figure 8.1
[10] Ibid.
[11] OECD (2009a)

3. Why are these systems moving rapidly ahead of others?

Popular stereotypes about Asian education are strong in some countries. But the evidence challenges these beliefs. High performance in education systems in East Asia comes from effective education strategies that focus on implementation and well-designed programs that continuously improve learning and teaching.

Neither cultural difference nor Confucian values can explain how, in just five years, Hong Kong moved from 17th to 2nd in PIRLS (the international assessment of Grade 4 students' reading literacy). Instead, education reforms created rapid changes in reading literacy.

Success cannot be explained by rote learning, either. PISA assesses meta-cognitive content knowledge and problem solving abilities. These skills are not conducive to rote learning. In fact, rote learning in preparation for PISA assessment would lead to lower scores (see Appendix B for examples of questions in the PISA assessments). Moreover, international research shows that classroom lessons in Hong Kong, for example, require greater deductive reasoning, with more new and advanced content.[12]

Success is also not driven by the size of the system (see Table 2 and Figure 5). High-performing education systems in East Asia vary in size. Korea is much larger than Hong Kong and Shanghai, and has more than 30 times the number of schools as Singapore.

[12] US Department of Education National Center for Education Statistics (2003)

Table 2: Size of East Asian education systems

	Shanghai[13]	Korea[14]	Hong Kong[15]	Singapore[16]
No. schools	1,622	11,312	1,105	343
No. students	1,322,800	7,260,996	780,849	490,246
No. teachers	104,700	412,634	51,871	28,073

Figure 5: Size doesn't matter: change in PISA performance of Australian States and Territories (reading 2000-2009)

Source: data from Thomson, et al. (2010)

[13] Excludes special schools. Source: Shanghai Education Commission (2011)
[14] Includes vocational high schools, excludes special schools.
[15] Source: Education Bureau (2011a), Education Bureau (2011b)
[16] Excluding Junior college/centralised institutes, pre-university education. Source: Minstry of Education (2011).

There is growing global agreement on what works in schools

A body of international research has identified the common characteristics of high-performing education systems.[17] They:

- Pay attention to what works and what doesn't. They attend to best practice internationally, give close attention to measuring success, and understand the state and needs of their system.
- Value teachers and understand their profession to be complex. They attract high quality candidates, turn them into effective instructors and build a career structure that rewards good teaching.
- Focus on learning and on building teacher capacity to provide it. Teachers are educated to diagnose the style and progress of a child's learning. Mentoring, classroom observation and constructive feedback create more professional, collaborative teachers.

These are the objectives of education policies around the world.

East Asian systems are implementing what works

The four high-performing education systems in East Asia have introduced one or several of the following reforms. In particular they:

- Provide high quality initial teacher education. In Singapore, students are paid civil servants during their initial teacher education. In Korea, government evaluations have bite and can close down ineffective teacher education courses.
- Provide mentoring that continually improves learning and teaching. In Shanghai, all teachers have mentors, and new teachers have several mentors who observe and give feedback on their classes.
- View teachers as researchers. In Shanghai teachers belong to research groups that continuously develop and evaluate innovative teaching. They cannot rise to advanced teacher status without having a published paper peer reviewed.
- Use classroom observation. Teachers regularly observe each other's classes, providing instant feedback to improve each student's learning.
- Promote effective teachers and give them more responsibility for learning and teaching. Master Teachers are responsible for improving teaching throughout the system.

In many other countries, including Australia, there is a disconnect between policy and classrooms

The OECD's 2008 Teaching and Learning International Survey (TALIS) revealed a large gap between policy objectives and results in the classroom in many education systems. In particular:

- Mentoring and induction programs are often poor. Most countries, including Australia, have such programs. Yet new teachers say they often fail to provide constructive feedback

[17] For example, see Barber and Mourshed (2007), Mourshed, *et al.* (2010) and OECD (2010b).

based on classroom observations. They are disconnected from student learning.

- Teacher development is often not suited to teachers' needs. One-off courses are common even though teachers believe, and the evidence shows, that longer-term individual and collaborative research has the greatest impact on student learning.

- Effective teaching is not recognised. Nearly three-quarters of teachers - and 90% of Australian teachers - say they would receive no recognition if they improved the quality of their teaching or were more innovative in the classroom.

- Feedback to improve teaching is often poor. Nearly half of teachers report that appraisal of their work has little impact on their teaching and is largely just an administrative exercise.[18]

In addition, initial teacher education often fails to prepare effective teachers. Many teachers find their initial education disconnected from the requirements for classroom teaching. Many courses have been found not to increase teacher effectiveness.[19]

High-performing education systems in East Asia understand the need for trade-offs to improve learning and teaching

Developing learning and teaching is time-intensive. There is no point pretending it isn't. Trade-offs are therefore required to improve learning and teaching.

In Shanghai, a key trade-off is that teachers teach larger, but fewer, classes compared to most other systems. Teachers teach classes of up to 40 students for 10-12 hours each week. In the US, teachers teach an average of 23 students for 30 hours a week (see Table 3).

Shanghai's approach frees up a significant amount of non-teaching time to engage in other activities known to have a large impact on student learning (see Figure 6). Activities include preparing for lessons, teacher collaboration, classroom observation and giving feedback.

By contrast, Australian teachers have only half as much time for such activities. And American teachers have only 12 minutes between each class to concentrate on the activities that are so important in high-performing education systems in East Asia.[20]

[18] OECD (2009b)
[19] OECD (2005)

[20] Grattan analysis, assumes 45 minute classes and a 38 hour working week.

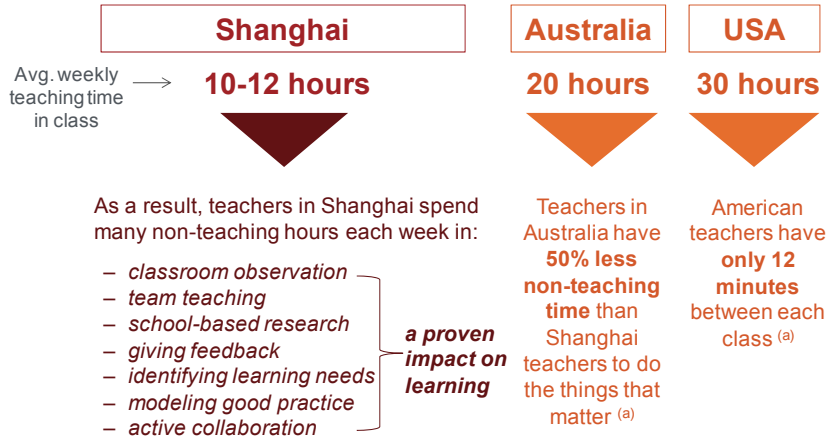
Table 3: Average weekly teaching time and class size (lower secondary)

	Average weekly teaching hours *(a)*	Class size *(b)*
Shanghai	10-12*	40*
Korea	15	35
Hong Kong	17†	36†
Singapore	-	35
Australia	20	23
USA	30	23
England	19	21β
EU21	17	22
OECD Average	18	24

Notes: *(a) Public schools only. 'Teaching hours' are number of hours that a teacher teaches a group or class of students. (b) Public schools only, lower secondary education.*

Source: *OECD (2011) Education at a Glance: Table D4.1, Table D2.1. *Grattan Institute interview with Shanghai Municipal Education Commission, 2011; † Hong Kong Education Bureau (secondary), β Department for Education (England), Statistical First Release (2011),*

Figure 6: Helping teachers focus on what matters: average time spent teaching per week in Shanghai, United States and Australia



Note: (a) assumes 45 minute classes and a 38 hour working week.
Source: Grattan analysis, based on Table 3.

4. What is effective learning and teaching?

Each of the high-performing education systems in East Asia has undertaken a deep analysis of learning and teaching and where it should be. For example, at the start of their reforms, Hong Kong began with a 20-month investigation of the state of learning and then mapped where it needed to be. The findings of that study determined all subsequent reform efforts.

This report does not seek to prescribe a definition of effective teaching and learning. That is for every education system and, to varying degrees, for every school to determine. But decisions should be based on evidence of what works in the classroom.[21]

The OECD Teaching and Learning Internal Survey (TALIS) identifies key aspects of teaching that have been shown to improve learning. They include:

- Teachers' content knowledge.
- Teachers' pedagogical knowledge, both of general principles and those specific to their subject.
- Teaching practices that focus on clear and well-structured lessons supported by effective classroom management.
- Teaching practices that emphasise individualised instruction.
- A commitment to higher-order problem solving, deep analysis of content, and activities requiring advanced thinking skills and deductive reasoning.
- Active professional collaboration that has a direct impact on learning and teaching. Key elements include classroom observations, team teaching and constructive feedback.

Two additional factors emphasise classroom management skills: the proportion of classroom time that is actually used for effective learning and teaching,[22] and, school and classroom climate.[23]

The evidence shows that these are universal qualities of good teaching, and improve student learning.[24] Yet every education system can add to them, emphasising particular styles or aspects of teaching and learning.

The point is not which styles of learning and teaching are chosen, but the degree of precision with which they are articulated. School reform is about changing behaviour to improve learning and teaching. Therefore, reform must start by identifying what those behaviours currently are - the state of learning and teaching - and where they should be. Reform can then target the required behavioural change.

[21] Barber and Mourshed (2007)

[22] Klieme and Rakoczy (2003); Clausen (2002).
[23] Hopkins (2005); Lee and Williams (2006); Harris and Chirspeels (2006).
[24] OECD (2009b); OECD (2010c)

5. Connecting policy to classroom learning

High-performing education systems in East Asia focus on policies designed to improve learning and teaching. Effective implementation connects policy to classrooms. This chapter shows how they have selected the right policies and then designed and implemented programs to change behaviour in schools and classrooms.

5.1 Selecting interventions

Effective intervention begins with a deep analysis of learning. The analysis compares the current state of learning (and then teaching) to where learning and teaching needs to be. To move learning and teaching to a higher level requires the design of policies and programs to target behavioural change. Doing so requires effective implementation of programs that have been shown to make widespread and sustained improvements in learning and teaching.

5.1.1 Improved learning as the primary goal

While considerable research has emphasised the importance of teachers,[25] reform in Hong Kong, for example, "clearly focussed on the 'core business of learning'".[26]

The key criterion here is learning, not teaching or, more importantly, teachers. The difference is subtle but important, with substantial policy implications. For example, a focus on learning in Singapore, has led the National Institute of Education (NIE), which educates all teachers, to cut subjects such as history and philosophy of education, and curriculum and assessment design, from their undergraduate teacher education syllabus. Feedback from teachers, principals and the Ministry of Education showed that these subjects were not leading to sufficient increases in students' learning. NIE now focuses more on subjects emphasising practical classroom teaching.

5.1.2 Setting priorities

Successful implementation depends on careful prioritisation. Implementation is resource intensive. It requires difficult decisions in allocating resources between programs. Financial resources are always scarce, yet are relatively visible. Management and teachers' time and capacity for change are also scarce resources. The lack of correlation between financial resources and learning outcomes suggests that time and capacity may be greater constraints than financial resources.

Trying to do too much thus often results in very little being done at all. Choosing not do something is often politically difficult, but successful implementation requires prioritising fewer programs, and cutting those with less impact on student learning. The process is vital. In short, doing what matters is easy. *Only* doing what *really* matters is hard.

[25] OECD (2009)
[26] Prof. Cheng, Kai-ming, Grattan Institute Learning from the Best Roundtable, Melbourne, September, 2011.

5.1.3 A mix of "push" and "pull"

Reforms that affect learning and teaching can be divided into:

- Push reforms that propel: they generate momentum for change by providing teachers and students with new content and support to improve current practice; and
- Pull reforms that compel: they create imperatives for change by setting new standards teachers and students must reach to fulfil organisational requirements.

The impact of the mix of reforms on the push and pull of learning and teaching in classrooms needs to be mapped. Doing so ensures all reforms are heading in the right direction, and facilitates prioritisation by identifying ineffective reforms.

5.2. Changing behaviour

Reform of learning and teaching is all about behavioural change. Unless principals, teachers and students change their behaviour, learning and teaching will not improve. But it is inherently difficult for policy makers to effect a change in the behaviour of others.

The general literature on behaviour change suggests that people will change their behaviour if:[27]

- They have a purpose to believe in;
- Role models act consistently;
- They have the skills and capacity for the new behaviour; and
- Reinforcement systems such as performance measures are consistent.

Successful implementation seems to require *all* of these elements to be present. This general theory is consistent with a growing body of evidence about what makes for successful education reform.[28]

Careful prioritisation and an implementation plan may still encounter resistance to change. Some bureaucrats, teachers, parents and students may be fearful, and reluctant to change. Every system has established interest groups that may seek to preserve their interests even when those interests may not serve the system's goals.[29] Whether these forces prevent implementation fundamentally depends on the political will for change.

Given the different nature of the political systems in East Asia, we have not focused specifically on how all of these political issues were negotiated. Every system must tailor reform to its own culture and context.

A more detailed discussion of strategy in the four systems in East Asia and the implementation of effective education reform appears in the Full report.

[27] Lawson and Price (2003)

[28] Barber and Mourshed (2007); Barber (2008) Barber, *et al.* (2011); Fullan (2009); Levin (2008); Brown, *et al.* (2011).

[29] Levin (2008)

6. Best practice reform: Hong Kong

In 1997 the United Kingdom restored Hong Kong to the People's Republic of China. Two years later, Hong Kong embarked on systemic education reform to prepare its children for the transition to a knowledge economy in a global labour market.

Hong Kong is a prime example of successful education strategy and implementation. Since 1999, it has reformed the entire education system using a 'whole-system implementation' approach.

Hong Kong conducted its strategy design and implementation planning in parallel. The process took 20 months and involved intense community consultation. Government, academic and business leaders, school principals and teachers all provided advice. This created an in-depth understanding of the problem, and of the context in which reform would be implemented.

Improving learning: choosing a strategic objective

Hong Kong's reforms were designed around one central objective: to improve student learning. An in-depth analysis identified that student learning was monotonous and exam-driven, and provided little room to 'think, explore and create'.[30] Teaching had become a one-way transmission process and learning had become passive.[31] Hong Kong wanted children to engage with learning activities, building on what they know, interacting, creating and exploring new knowledge.[32] Its new definition of learning was a major shift from the previous emphasis on 'knowledge acquisition'.[33] The new definition allowed Hong Kong authorities to map the difference between what student learning had been and what they wanted it to become.

Reforming teaching to improve learning: choosing the right policy levers

Hong Kong identified that improving teaching was the single most important policy lever to improve learning. By analysing learning, they were also able to map the change required to take teaching from what it was to where it should be.

Hong Kong wanted students to develop learning skills rather than purely acquiring academic knowledge. Therefore it wanted teachers to move from directly transmitting knowledge to a constructivist approach: from the drilling of students to providing broad learning experiences. These included project and enquiry-based learning to help students develop critical thinking, problem solving and communication skills.

Hong Kong also introduced integrated learning areas rather than compartmentalised subjects. It moved beyond an exclusive focus on textbooks to adopt diversified learning and teaching resources to deliver curriculum. Formative assessments were emphasised, showing *how* students were learning, rather than simply *what* they learnt.

[30] Education Commission (2000)
[31] Curriculum Development Council (2000)
[32] Education Commission (2000)
[33] Grattan Institute interviews at Education Bureau, Hong Kong, (2011)

Implementation

Hong Kong's success has stemmed from its detailed and precise approach to whole-system implementation. It undertook implementation planning simultaneously with strategy design; one was not separate from the other. The focus throughout was how to implement the reforms in schools and classrooms to increase learning.

Hong Kong used every part of its education system as implementation tools to reform teaching and pedagogy. Below is a brief description of how each element of the system was used:

- *Curriculum reform* was the 'push' of reform, the key to changing pedagogy. Curriculum reform helped shift teachers' thinking from 'what' students should learn to 'how' they learn. It focused teachers on providing 'learning experiences' for students rather than simply transmitting knowledge. Throughout the new curriculum framework, expectations were outlined for students' learning experiences and practical examples of teaching strategies were provided.

- *Reform to student assessment* was the major 'pull' to improve pedagogy. Changes to student assessments focused on shifting the reliance on written tests and exams that tested *what* students had learned to broader assessment tools and mechanisms that also assessed *how* students learn. Hong Kong:

  - Removed high-stakes public exams to ease the pressure on students and teachers to prepare for exams, giving greater time in school to focus on improving learning;

  - Introduced assessment for learning (formative assessment) to help teachers identify how their students were learning and to change their pedagogy where necessary; and

  - Introduced school-based assessment, allowing teachers to assess learning that cannot be demonstrated in paper and pencil exams.

- *Teaching and learning resources* were developed for teachers to implement curriculum and assessment changes, with practical examples that shifted teachers' approaches in the classroom.

- *School leadership* was vital in improving teaching practice. Hong Kong created new leadership positions in order to put implementation leaders into every school. Curriculum leaders were assigned to every primary school. In secondary schools curriculum leaders were assigned to every key learning area. Their main job was to increase teaching. They were given extensive training on curriculum and pedagogy reform, enabling them to help other teachers to implement changes in every classroom.

- Hong Kong built *school principals' capacity* to implement reforms. Aspiring principals now complete a certification in principalship that specifically includes detail on the strategic direction and policy environment of education in Hong Kong. They also study learning, teaching, the curriculum, teachers' professional development and quality assurance, and accountability.

- *Academic research funds* were established for academics to work with schools to implement reforms to learning and teaching.
- *Teacher professional development and in-school support* were essential to implement behavioural and cultural change in schools and classrooms. Hong Kong teachers must now undertake professional development that both continues to develop their competencies,[34] and assists in implementing reform through the Continuing Professional Development Framework.[35]

  In-school support programs provide expert support for teachers to implement reforms. The support includes collaborative lesson planning and collaborative research and development projects. Further professional development includes workshops, study groups and sharing sessions, and consultancy services for curriculum and pedagogy issues.
- *Teachers' teaching and working time* was altered to improve collaboration, learning and capacity building. Collaborative lesson preparation was introduced and a culture of classroom observation developed to help teachers learn from each other.
- *School accountability: whole-school inspections* provided an accountability mechanism to monitor, evaluate and enforce the implementation of improved teaching practice.
- *School accountability: focus inspections* concentrated on a particular area of reform. Teams of staff from the Education Bureau (EDB) provide support for introducing peer feedback in schools and developing teachers to implement pedagogical changes.
- *Increased school autonomy* for school principals and teachers was important. It gave principals and teachers a sense of ownership and control over the changes and facilitated ground level implementation in schools and classrooms.

Allocating resources, then reallocating them following feedback and evaluation

Allocating resources to the implementation of reforms, not just program design, is essential for school improvement.[36] In Hong Kong, resources were specifically set aside for implementation. Resource priority was accorded to changes to basic education in primary and early secondary school. Funds were explicitly matched to implementation timelines. Additional recurrent funding was earmarked for primary and secondary schools to employ extra staff or services that would help reduce teachers' workloads, giving them additional time to implement reforms.[37]

Details of best practice reforms in Hong Kong are extensively discussed in the Full report. It also provides a case study of the implementation of a new reading pedagogy that led to Hong Kong making dramatic improvements in reading literacy.

[34] As described in the Teachers' Competency Framework Advisory Committee on Teacher Education and Qualifications (2003)
[35] Advisory Committee on Teacher Education and Qualifications (2003)

[36] Levin (2008); Levin and Fullan (2008)
[37] Education Commission (2000)

7. Initial teacher education

Program design features that increase learning

Initial education in Singapore has a strong emphasis on practical skills and student learning. The National Institute of Education (NIE) is the sole provider of initial teacher education in Singapore.[38] Its strength is maintained through its close relationship with the Ministry of Education and schools. Ongoing feedback, secondments, joint meetings and partnerships ensure that all are focused on improving school learning.

For example, feedback from the Ministry and schools led the NIE to remove undergraduate electives such as the philosophy and history of education from the initial teacher education course in favour of practical teaching skills.

Other key features include:

- A strong focus on subject content. For example, maths teachers graduate with the same content knowledge as straight mathematics graduates from the National University of Singapore.
- Teachers are recruited and paid as civil servants during their initial teacher education. This is expensive. Yet high retention rates during the course and in the early careers of teaching create significant savings, and also helps to improve the standard of applicants to the course.
- The financial incentives for NIE focus their activities on continually improving student learning. The Ministry puts a cap on the number of students (thereby increasing competition to get in) and provides substantial funding for school-based research. Importantly, academics at NIE are promoted on their contribution to improving learning in schools, not just on academic papers.

Implementation

In Korea, reform to the evaluation and development of teacher education courses has improved the quality of initial teacher education. Evaluations now have 'teeth'. A-rated institutions receive substantial financial bonuses. Courses with a D-rating must reduce their student numbers by 50% the following year. Universities have been prompted to invest to improve the quality of teacher education.

The Education Ministry also compels graduates to sit examinations before they become teachers (these are apart from those they undertake to meet course requirements). Entry examinations can be a highly effective mechanism that enables government to influence the quality of teacher educations. Institutions whose graduates do less well at the exam are given a clear signal to lift their game.

Details of this program and key implementation steps are extensively discussed in the Full report.

[38] NIE is an autonomous research and teaching institute within Nanyang Technological University.

8. School principal education

Program design features that increase learning

In Singapore, school leaders are considered vital to school transformation.[39] Leaders are expected to innovate continuously to get the best from their staff and school. Since 2000, an executive education program for principals has helped achieve this goal.

Leadership development starts early in the careers of Singapore's educators. Extensive teacher appraisal and feedback is required to identify potential leaders. Leaders therefore do not self-select, but rather are nominated by the Ministry in discussion with schools and principals.

Before undertaking specific education and training, potential leaders are put through extensive interviews and assessments to assess their leadership capabilities.

If they pass these hurdles, they undertake a six-month, full-time *Leaders in Education Program* (LEP). The focus is not on technical administration skills but on leadership and critical self-reflection. It includes a fully sponsored two-week visit to an international educational institution.

Those who do well in the program are matched to particular schools, based on their skills and school needs. The formal leadership program is followed by continuous mentoring, peer group learning, and professional development.

Once in their positions, principals are continuously challenged to improve their personal leadership skills and increase the dynamism of the school education sector. For example, principals are rotated through different schools every five to eight years, since this is the time period in which they are considered to have a maximum impact on a school.

Implementation

Feedback loops are crucial in developing school principal education. With input from the Ministry, the NIE shaped its course based on an assessment of the skills, weaknesses and development requirements of existing school principals.

Singapore offers leadership education that includes training in other industries and countries. Flexible career structures and high-quality education and training take leaders out of their comfort zone. The Ministry of Education frequently moves potential leaders to different positions so they can learn in different school environments. Distributing strong school leadership throughout the system raises student expectations and performance.

Details of this program and key implementation steps are extensively discussed in the Full report.

[39] Ng (2008)

9. Induction and mentoring

Program design features that increase learning

While many systems around the world have induction and mentoring programs, many are not done well. Shanghai is the gold standard. Its induction and mentoring programs involve frequent classroom observation with constructive feedback, a practice known to improve student learning.[40]

Mentors and mentees regularly observe each other's lessons, and observe demonstration lessons together. A middle level teacher observes at least one mentor lesson a week.[41] Mentoring focuses squarely on the basics of student learning and teaching, not just on administrative and emotional support. It concentrates on developing core teaching skills such as diagnosing student learning, subject-specific pedagogy, classroom management and research skills.

Mentoring is for all teachers, not just beginning teachers. It is a key part of a teacher's job description and a requirement for promotion.[42]

Shanghai partly owes its success in mentoring to the intensity with which it is done. Teachers have time and space to meet regularly and reflect on what works and what needs to be improved. Trade-offs in other areas, in particular teaching fewer but larger classes, free up teachers' time for mentoring. They also have incentives to engage intensively. Time spent in mentoring and induction counts toward hourly requirements for professional learning.[43]

Outstanding teachers are promoted and given additional responsibility for mentoring in other schools. Great teachers are not promoted out of the classroom to leadership positions, as they are in many countries. Instead, they are promoted into more classrooms.

In Shanghai's induction programs, beginning teachers learn from different teachers in different settings. They have multiple specialist mentors and learn from senior teachers in research and lesson groups. They model effective practice in demonstration lessons for group feedback and undertake research projects under mentor guidance.

Implementation

Hong Kong does not have a long-established system of induction and mentoring. But classroom observation and developmental feedback are now part of induction in all schools.

Details of this program and key implementation steps are extensively discussed in the Full report.

[40] Hattie (2009)
[41] Gezhi High School documentation (2011)
[42] Grattan Institute interview at Shanghai Municipal Education Commission (2011)
[43] Ibid.

10. Research and lesson groups

Program design features that increase learning

In Shanghai, teaching is seen as a research-oriented profession. Teachers join research groups in schools that study and discuss the best ways for students to learn. Teachers are expected to produce research papers of sufficient quality to be published and thereby improve pedagogy throughout the school system.[44] Exemplary groups present research findings in open lessons to other teachers at the District level. Promotion to advanced and Master Teacher status requires a candidate to have their published papers reviewed by an expert committee.[45]

At the start of each research project, groups identify a particular aspect of learning. They initially examine theory and evidence, then trial different teaching practices drawing on their findings. In better schools, research reports are published on the findings, creating a record of pedagogical development at each school. The process is an essential part of teachers' professional learning and is factored into promotion.

Both research and lesson groups involve regular classroom observations, followed by constructive feedback. Such collaboration is shown to have significant impacts on student learning.[46]

Research and lesson groups are an important part of a teacher's week. The groups meet between one to two hours a week in some schools. Teachers undertake between six to eight observations per semester in these groups.

In lesson groups, teachers work together to plan lessons, examine student progress, and prepare teaching content. They are central in combating inequality. Students who are falling behind – whose learning needs are not being addressed – are quickly identified and assisted.

Implementation

Policy makers may feel they need to develop schools' capacity to do research before they seek to introduce research groups into their education system. Singapore provides a study in how to build this capacity. It developed a program to ensure that at least one teacher in every school had the capacity to undertake evidence-based research. He or she would then lead research in the school, and help colleagues to develop their research skills.

Details of this program and key implementation steps are extensively discussed in the Full report.

[44] Shanghai research groups are comprised of teachers of the same subject across a school (e.g. maths teachers). Lesson groups involve teachers of the same subject and same year level (e.g. maths teachers of Year 8 students).
[45] Shanghai Municipal Education Commission documentation
[46] Hattie (2009)

11. Classroom observation

Constructive feedback based on classroom observation has consistently been shown to have a significant impact on student learning.[47] Feedback creates a culture of exchanging ideas within and among schools.[48]

Teaching is an open profession in the four high-performing East Asian systems. Teachers regularly observe their peers. Carefully designed mentoring and teacher appraisal make this culture of observation and professional collaboration possible.

Implementation

Creating classroom observation as a normal part of teachers' daily lives requires behavioural and cultural shifts in many systems. Hong Kong and Singapore, for example, introduced extensive reforms to build a culture of classroom observation and feedback in schools. Reform required changes to the way schools operated and changes to the job requirements of principals and teachers. Principals must now act to improve classroom observations. Teachers are not only responsible for the learning of their own students, but of all students in their school. They are also responsible for the professional learning of other teachers.

As a result of these changes, teachers more regularly welcome colleagues into their classrooms. Reform has become self-sustaining as the school culture encourages demonstration of good practice to others, constructive feedback and reflection.

In Shanghai, lesson observation underpins the functioning of professional learning. Many other programs would not be effective without it. Mentors and mentees regularly observe each other's lessons. Similarly, members of research and lesson groups or professional learning communities observe and support each other as they trial different ways of teaching. Teachers regularly observe exemplary teachers in the school and at District level.

Shanghai even trains teachers in classroom observation. Huang Pu District provides training that emphasises teachers working in teams while observing learning and teaching in classrooms. Teachers monitor individual student progress over time, and engage in pre- and post- observation discussion. The observing teacher is expected to focus on how the teaching affects the student - not just on the teacher or his or her teaching.

Teaching should always be observed through the lens of improving student learning. For example, observation may focus on particular students to analyse their learning. Feedback to the teacher after the class focuses on how to improve each student's learning. This feedback is an important mechanism to improve equity in the classroom.

Details of this program and key implementation steps are extensively discussed in the Full report.

[47] Hattie (2009)
[48] Blackwell and McClean (1996), Munson (1998)

12. Teacher career structures

Since 2000, reforms in Singapore have increased teachers' pay and status, and created a comprehensive system of teacher appraisal tied to meaningful professional learning.

These reforms have had a substantial impact. Teacher attrition rates, which were rising, are now consistently less than one-third of the rate in the rest of the public service.[49] A new career structure has developed specialist teaching, education and leadership skills. Importantly, good teachers are no longer 'promoted out of the classroom'. Instead, they are effectively promoted into more classrooms by playing an extensive developmental role across the system.

Teachers in Singapore can now follow different career tracks: Senior Specialist (teachers with high-level specific skills and education knowledge), Leadership, and Teaching.[50] Advancement within and between tracks is determined by the teacher's individual performance and potential, as measured by an Enhanced Performance Management System (EPMS), and by each school's needs.[51]

The EPMS is a performance management system that has both evaluative and developmental roles. It includes extensive planning of teachers' activities, frequent coaching and mentoring, reflection and feedback.[52] It is strongly linked to professional learning and teacher pay. Each teacher, leader and specialist is given a grade (from A-E) after an end-of-year review. High performers receive bonus payments.

Implementation

Reforming career structures is never easy. Singapore provides a model for how to change a profession and overcome the fears and resistance that can accompany changes to performance management and pay structures. Implementation steps included:

- Clearly identifying problems with the old system and articulating how they would be addressed
- Extensive dialogue and engagement throughout the reform
- Sequencing of reforms (for example, bonus payments were delayed until after the performance management system was operating effectively)
- Comprehensive and sustained capacity building in schools, including ongoing training for senior teachers, and seminars for new teachers.

The reforms continue to evolve in response to feedback from teachers, schools and other stakeholders.

Details of this program and key implementation steps are extensively discussed in the Full report.

[49] Grattan Institute interview with Ministry of Education, Singapore, (2011)
[50] OECD (2009d)
[51] Ibid.
[52] Grattan Institute interview with Ministry of Education, Singapore, (2011)

Appendix A: Participants at Grattan Institute Roundtable, 2011

Learning from the Best: A Grattan Institute Roundtable on High-Performing Systems in East Asia, 27-28 September 2011

Chairs

Dr Ben Jensen, Program Director - School Education, Grattan Institute

Mr Tony Mackay, Asia Education Foundation

International participants

Professor Cheng Kai-ming, Chair Professor of Education, the University of Hong Kong, Hong Kong Special Administrative Region

Dr Andreas Schleicher, Special Advisor on Education Policy to the OECD's Secretary-General and Deputy Director, OECD Directorate for Education

Dr Shin Hye-Sook, Research Fellow, Korean Educational Development Institute (KEDI), Republic of Korea

Professor Tan Oon Seng, Dean - Teacher Education, National Institute of Education, Singapore

Dr Yu Hyunsook, Director-General, Korean Educational Development Institute (KEDI), Republic of Korea

Dr Zhang Minxuan, President, Shanghai Normal University, China

Professor Yong Zhao, Presidential Chair and Associate Dean, Department of Educational Methodology, Policy and Leadership, University of Oregon, USA

Australian and New Zealand Participants

The Hon. Julia Gillard MP, Prime Minister of Australia

The Hon Peter Garrett AM, MP, Federal Minister for School Education, Early Childhood and Youth

Mr Keith Bartley, Chief Executive, Department of Education and Children's Services, South Australia

Ms Sue Christophers, General Manager- International Education Division, Department of Education and Early Childhood Development, Victoria

Mr Nicholas Conigrave, Associate Director, Hay Group

Mr Bill Daniels, Executive Director, Independent School Council of Australia

Ms Janet Davy, Group Manager, Department of Education and Workplace Relations

Mr Stephen Elder, Director of Catholic Education, Catholic Education Office - Archdiocese of Melbourne

Ms Margery Evans, Chief Executive Officer, Australian Institute for Teaching and School Leadership

Ms Liz Forsyth, Partner, Government Advisory Services, KPMG

Ms Julie Grantham, Director General for Education, Department of Education and Training, Queensland

Dr Peter Hill, Chief Executive Officer, Australian Curriculum, Assessment and Reporting Authority

Ms Amélie Hunter, Research Associate, Grattan Institute

Ms Diane Joseph, Deputy Chief Executive, Department of Education and Training, ACT

Ms Kathe Kirby, Executive Director, Asia Education Foundation

Ms Ellen Koshland, Centre for Public Education

Ms Leslie Loble, Chief Executive of the NSW Office of Education, Department of Education and Communities

Ms Susan Mann, Chief Executive Officer, Education Services Australia

Professor Geoff Masters, Chief Executive Officer, Australian Council for Education Research

Ms Jenny McGregor, CEO of Asialink and Executive Director of Asia Education Foundation

Mr Rob McIntosh, Deputy Secretary – Tertiary, International and System Performance, Ministry of Education, New Zealand

Ms Lyn McKenzie, Deputy Director-General, Department of Education and Training, Queensland

Ms Zoe McKenzie, Senior Adviser, Office of the Hon. Ted Baillieu, Premier of Victoria

Ms Maxine McKew, Social Ventures Australia

Ms Jan Owen, Centre for Public Education

Ms Lisa Paul, Secretary, Department of Education and Workplace Relations

Ms Kym Peake, Deputy Secretary, Skills Victoria

Mr Colin Pettit, Secretary, Department of Education, Tasmania

Ms Julie Sonnemann, Research Associate, Grattan Institute

Mr Donald Speagle, Deputy Secretary, Department of Premier and Cabinet-Victoria

Mr Michael Traill, Chief Executive, Social Ventures Australia

Ms Catherine Wall, Deputy Secretary – Schools, Department of Education, Employment and Workplace relations

Mr Chris Wardlaw, Deputy Secretary, Department of Education and Early Childhood Development, Victoria

Appendix B: Sample PISA questions

Sample Science Question:

Imagine that you live near a large chemical factory that produces fertilisers for use in agriculture. In recent years there have been several cases of people in the area suffering from long-term breathing problems. Many local people believe that these symptoms are caused by the emission of toxic fumes from the nearby chemical fertiliser factory. A public meeting was held to discuss the potential dangers of the chemical factory to the health of local residents. Scientists made the following statements at the meeting.

Statement by scientists working for the chemical company:

> *"We have made a study of the toxicity of soil in the local area. We have found no evidence of toxic chemicals in the samples we have taken."*

Statement by scientists working for concerned citizens in the local community:

> *"We have looked at the number of cases of long-term breathing problems in the local area and compared this with the number of cases in an area far away from the chemical factory. There are more incidents in the area close to the chemical factory."*

Question: The owner of the chemical factory used the statement of the scientists working for the company to argue that "*the emission fumes from the factory are not a health risk to local residents*". Give one reason, other than the statement by scientists working for the concerned citizens, for doubting that the statement by scientists working for the company supports the owner's argument.

Answer: An appropriate reason is given for doubting that the statement supports the owner's argument, such as:

- The substance causing the breathing problems may not have been recognised as toxic.
- Breathing problems may have been caused only when chemicals were in the air, not in the soil
- The samples may not be representative.
- The scientists are being paid by the company.

Sample Maths Question

In Zedland, opinion polls were conducted to find out the level of support for the President in the forthcoming election. Four newspaper publishers did separate nationwide polls:

- Newspaper 1: 36.5% (poll conducted Jan 6, sample of 500 randomly selected citizens with voting rights)
- Newspaper 2: 41.0% (poll conducted on Jan 20, sample of 500 randomly selected citizens with voting rights)
- Newspaper 3: 39.0% (poll conducted on Jan 20, sample of 1000 randomly selected citizens with voting rights)
- Newspaper 4: 44.5% (poll conducted on Jan 20, with 1000 readers phoning in to vote).

Question: Which newspaper's result is likely to be the best for predicting the level of support for the President if the election is held on January 25? Give two reasons to support your answer.

Answer: Newspaper 3. The poll is more recent, has a larger sample size, a random sample, and only voters were asked.

Source: OECD (2009c)

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People's Republic of China

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Principles and general objectives of education

In terms of the Education Law of 1995, education in the People's Republic of China shall serve the construction of socialist modernization, be combined with production and labour, and satisfy the needs of training constructors and successors with all round development of morality, intelligence and physique for the socialist cause. The State shall conduct education for promoting among learners patriotism, collectivism and socialism as well as ideals, ethics, discipline, legality, national defence, and ethnic unity. Education shall be carried out in the spirit of inheriting and expanding the fine historical and cultural traditions of the Chinese nation and assimilating all the fine achievements of the civilization progress of human beings. Article 3 specifies that in developing the socialist educational undertakings, the State shall uphold Marxism-Leninism, Mao Zedong Thought and the theories of constructing socialism with Chinese characteristics as directives, and comply with the basic principles of the Constitution.

Article 24 of the Constitution, promulgated in 1982 (and amended in 1988, 1993, 1999 and 2004), stipulates that the State strengthens the building of socialist spiritual civilization by promoting education in high ideals, ethics, general knowledge, discipline and legality, and by promoting the formulation and observance of rules of conduct and common pledges by various sectors of the population in urban and rural areas. The State advocates the civic virtues of love for the motherland, for the people, for labour, for science and for socialism. It conducts education in patriotism and collectivism, in internationalism and communism and in dialectical and historical materialism, to combat capitalist, feudalist and other decadent ideas.

The educational equity is fundamental for social equity. To provide all people the access to education and ensure the opportunity for the quality education constitutes the major content and essential condition for the construction of the socialist harmonious society. (MOE, 2008).

Laws and other basic regulations concerning education

On 18 March 1995, the Third Session of the Eighth National People's Congress examined and adopted the **Education Law of the People's Republic of China**, which came into force on 1 September 1995. This Law guarantees the strategic position of education in the social and economic development, implements the significant decision of the State of establishing education development as a priority, and guarantees the reform and development of education. Article 9 stipulates that the citizens shall have the right and duty to be educated and enjoy equal educational opportunities of education regardless of ethnic community, race, sex, occupation, social conditions or religious belief. According to article 12, the Chinese language, both oral and written, shall be the basic oral and written language used in schools and other educational institutions. Schools or other educational institutions which enrol mainly students from ethnic minority groups may use the language of the respective

ethnic community or the native language commonly adopted in that region. Schools and other educational institutions shall popularize the nationally common spoken Chinese and the standard written characters.

On 15 May 1996, the Nineteenth Session of the Standing Committee of the Eighth National People's Congress adopted the **Vocational Education Law**, which came into force on 1 September, 1996. This Law was intended to accelerate the reform and development of vocational education system.

On 28 December 1990, the Seventeenth Session of the Standing Committee of the Seventh National People's Congress examined and approved the **Law on the Protection of the Disabled**, which has been revised in 2008. In order to guarantee the right of the disabled to basic education, on 23 August 1994 the State Council issued the **Regulation on Education of the Disabled**. The Regulation stipulates that education of the disabled is an obligation of the State; it also establishes that people's governments at all levels should strengthen leadership, planning and development of education of the disabled. Furthermore, it foresees a gradual increase of financial inputs and an improvement of educational provision for the disabled. The educational authorities of the State Council are responsible for education of the disabled in the whole country, and local people's governments and educational authorities are responsible for the education of the disabled in their regions.

In order to improve quality of teachers and improve teacher training, on 12 December 1995 the State Council promulgated the **Regulation on Qualifications of Teachers**. The Regulation stipulates that Chinese citizens who are teaching in educational institutions, at all levels and of all types, should acquire teacher's qualifications according to law. The Regulation stipulates the categories, application, recognition and pre-conditions of teachers' qualifications.

On 31 October 1993, the Fourth Meeting of the Standing Committee of the Eighth National People's Congress approved the **Teacher Law of the People's Republic of China**, which came into force on 1 January 1994. This Law introduced important measures for the improvement of teachers' qualifications and the protection of teachers' rights. The Law recognizes that teachers are professionals who exercise the functions of education and teaching, and are charged with the duty of imparting knowledge and educating people training builders and successors for the socialist cause and enhancing the quality of the nation. It also calls for the whole society to respect teachers and to this end the 10th September of each year is designated as Teachers' Day.

The **Higher Education Law of People's Republic of China** was approved on 29 August 1998 by the fourth Conference of the Ninth Standing Committee of National Congress. This Law, which came into force on 1 January 1999, is the first comprehensive legal document regulating higher education in the country.

The **Regulations on Academic Degrees of the People's Republic of China**, adopted at the 13th Meeting of the Standing Committee of the Fifth National People's Congress on 12 February 1980, and amended at the 11th Session of the Standing Committee of the Tenth National People's Congress on 28 August 2004, stipulate the requirements for awarding bachelor's, master's and doctoral degrees.

The **Law on Compulsory Education**, adopted at the Fourth session of the Sixth National People's Congress on 12 April 1986 and amended at the 22nd session of the Standing Committee of the Tenth National People's Congress on 29 June 2006, stipulates that the States adopts a system of nine-year compulsory education (consisting of two stages, e.g. primary and lower secondary education). According to this Law all children who have attained the age of 6 years shall enroll in school to complete compulsory education. For the children in those areas where the conditions are not satisfied, the entry age may be postponed to 7 years. All children and adolescents who have the nationality of the People's Republic of China and have reached the school age shall have equal right and have the obligation to receive compulsory education, regardless of gender, nationality, race, status of family property or religious belief. No tuition or miscellaneous fee may be charged in the implementation of compulsory education.

The **Private Education Promotion Law of the People's Republic of China**, adopted at the Thirty-first Meeting of the Standing Committee of the Ninth National People's Congress on 28 December 2002, came into force on 1 September 2003. The stipulates that the establishment of non-public schools that provide education for academic credentials, preschool education, training for preparing self-study examinations and other cultural education shall be subject to examination and approval by the administrative departments of education under the people's governments at or above the county level within the limits of their powers defined by the State; the establishment of a non-public school that mainly provides vocational skills, including training for vocational qualifications, shall be subject to examination and approval by the administrative department of labour and social security under the people's government at or above the county level within the limits of its powers defined by the State. The Law made it possible for foreign institutions to offer programmes in China through joint ventures with Chinese higher education institutions.

Administration and management of the education system

Governments at the central, provincial, prefecture, municipal and county levels have departments of education responsible for the administration of education. According to the Education Law, the **State Council** and **local people's governments** at all levels shall guide and administer education according to the principles of management at different levels and with a suitable division of responsibilities.

The administrative educational departments under the State Council are in charge of educational work throughout the country, and undertake overall planning, coordination and management of educational activities. The administrative departments of education under the people's governments, at or above the county level, are in charge of educational activities in their respective administrative regions. Other administrative departments of the people's governments, at or above the county level, are responsible for the relevant educational activities within their jurisdiction.

Other ministries and commissions under the State Council also have departments in charge of educational administration within their sphere of competence.

The State Education Commission was the agency in charge of education throughout the country between 1985 and 1998. The **Ministry of Education** is the highest educational administrative body. It takes charge of implementing the relevant laws and regulations, principles and policies, defining specific educational policies, preparing and coordinating educational development plans, coordinating the education-related work of all departments in the country, and providing guidance to the reform of the education system. The management of preschool education is mainly within the responsibility of local governments. Compulsory education (e.g. the nine-year programme covering primary and junior secondary education) is guided by the State Council and principally managed by the people's governments at the county level; its implementation is carried out in accordance to the overall planning of the provincial, autonomous regional and municipal people's governments. Vocational education is under the leadership of the State Council, with the local authorities taking up the major responsibility, and the overall coordination of government and the participation of the society. Higher education is under the supervision of the State Council and administered by the people's governments of the provinces, autonomous regions and municipalities directly under the central government.

The **National Education Examinations Authority**, under the Ministry of Education, coordinates and supervises the system of national education examinations. The **National Center for School Curriculum and Textbook Development** (NCCT), an agency affiliated to the Ministry of Education, was established in 1998 on the basis of the former Research Center for School Curriculum and Textbook Development. NCCT has the following main functions: conducting research on the evaluation of elementary, junior secondary and senior secondary education, and formulating standards for the assessment of learning results and teaching materials in elementary, junior secondary and senior secondary education; assessing curricula, textbooks, educational materials, and audio and video products in elementary, junior secondary and senior secondary education; assessing the teaching and administration of teaching affairs at elementary and middle schools; acting as the secretariat of the National Committee for the Examination and Approval of Textbooks used at elementary and middle schools; and accreditation of schools for children of foreign nationals. Additionally, the Ministry of Education has established sixteen **Basic Education Curriculum Research Centers** all over the country, mainly within normal (e.g. teacher education) universities.

The **China Scholarship Council** (CSC) is a non-profit institution affiliated to the Ministry of Education. Its objective is to provide, in accordance with the law, statutes and relevant principles and policies, financial assistance to the Chinese citizens wishing to study abroad and to the foreign citizens wishing to study in China in order to develop the educational, scientific and technological, and cultural exchanges and economic and trade cooperation between China and other countries, to strengthen the friendship and understanding between Chinese people and the people of all other countries, and to promote world peace and the socialist modernization drive in China.

The **China Academic Degrees and Graduate Education Development Center** (CDGDC) is an administrative department under the Ministry of Education, operating under the joint leadership of the Ministry and the Academic Degrees Committee of the State Council. The CDGDC, a non-profit agency with the

independent qualification of legal entity, was established in 2003, evolving as one department from China Academic Degrees and Graduate Education Development Center affiliated to Tsinghua University.

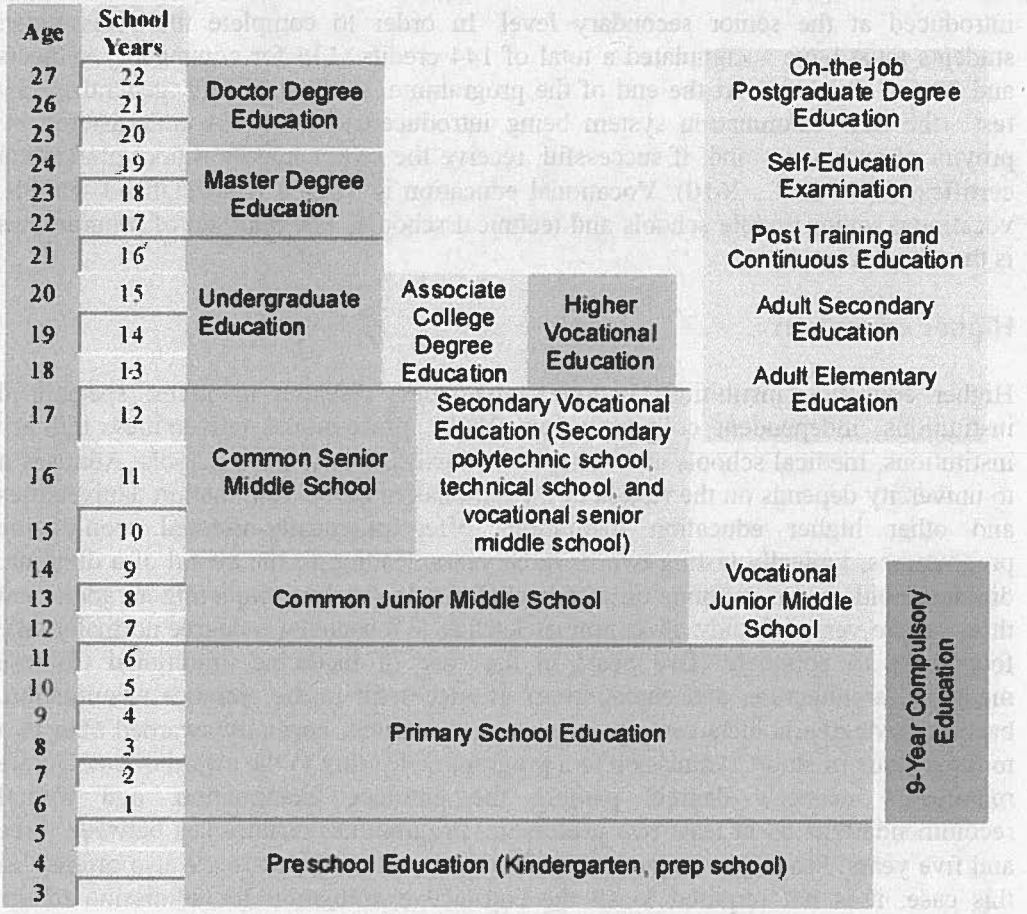
Founded in 1957, the **China National Institute for Educational Research** (CNIER) is the only national-level comprehensive educational research institute in China mainland under the direct administration of the Ministry of Education. CNIER is primarily engaged in many aspects of educational policies research, basic theoretical research, experimental and comparative educational research. CNIER administers two publishing houses specializing on education and four major academic journals. The National Educational Planning Office based in CNIER administers educational research programmes of the whole country. CNIER also serves as a steering organization for the educational research institutes in over thirty provinces.

Educational inspection is a system whereby governments (at or above the county level) monitor, examine, assess and direct the educational activities as well as the work of schools (mainly primary and secondary education) being administered by the government at the lower level. The **State Education Inspectorate** is the agency for national educational inspection. It is composed of a chief inspector, a deputy chief inspector and some 60 inspectors that the State Education Commission has engaged from the provinces and ministries. The Inspectorate has an office to take charge of day-to-day operation. Local governments have also established similar agencies. Departments of inspection have been created in the provinces, autonomous regions and municipalities directly under the central government.

The main responsibilities of the departments of inspection at all levels are to: monitor and examine the implementation of state laws, regulations, principles and policies on the part of the governments at the lower level, their departments of education and schools; assess and give guidance to educational work as administered by the governments at the lower level; give advice and report to governments and their education departments with regard to educational activities.

Structure and organization of the education system

People's Republic of China: structure of the education system



Source: National Center for Education Development Research, 2008.

Pre-school education

Pre-primary education caters to children in the age group 3-5 years (three-year programme either full- or part-time) and is offered in kindergartens and preschool classes. Preschool education (one-year programme before primary education) is not compulsory.

Primary and lower secondary education

The nine-year compulsory education programme covers primary and junior secondary education; the entry age is normally 6. In most provinces, the programme is organized into six years of primary and three years of junior secondary education; in other

provinces the 5 + 4 pattern is still followed. Vocational education is offered in vocational junior middle schools.

Secondary education

Senior secondary education lasts three years (general senior middle school) and is for students having passed the entrance examination. A credits system has been introduced at the senior secondary level. In order to complete the programme, students must have accumulated a total of 144 credits (116 for compulsory subjects and 28 for electives). At the end of the programme, students sit the 'general ability test' (the new examination system being introduced since 2002) administered by provincial authorities and, if successful, receive the senior middle school graduation certificate. (NUFFIC, 2010). Vocational education is offered is specialized schools, vocational senior middle schools and technical schools. The duration of programmes is three to four years.

Higher education

Higher education institutions include universities, research institutes, specialized institutions, independent colleges (since 2008), professional universities, military institutions, medical schools and colleges, and executive training schools. Admission to university depends on the results of the national entrance examination. Universities and other higher education institutions offer practically-oriented, non-degree programmes, typically lasting two or three years, leading to the award of a diploma; diploma holders can continue on to a bachelor's degree by completing an additional three or two years of study. Programmes leading to a bachelor's degree normally take four years to complete (five years in the case of medicine, traditional Chinese medicine, architecture, and engineering). If successful in the entrance examination, bachelor's degree holders can pursue a master's degree, normally awarded after two to three years of study. Admission to a programme leading to the award of a doctorate requires a master's degree, passing the entrance examination, and formal recommendations by at least two professors. Programmes usually last between three and five years. Programmes combining a master's and a doctorate are also offered; in this case, it is not required to sit the entrance examination for admission to the doctorate programme. (See: NUFFIC, 2010).

The school year at the primary and secondary levels is divided into two terms, with the first term beginning in autumn (September), and the second term beginning in spring (usually in March). At the primary and lower secondary levels, each school year normally includes 34 weeks of classes, one week for school activities, one week for community-based activities, two weeks for general review and examinations (three weeks at the lower secondary level), and one week in reserve.

The academic year consists of 36 weeks (eighteen weeks for each of the two terms), two or three weeks for general review and tests, and eleven weeks for winter and summer vacations. A number of higher education institutions that have adopted the credit system follow a different approach, with the school year divided into three terms in order to strengthen practical teaching.

The educational process

The Law on Compulsory Education stipulates that the teaching approach, teaching contents and curriculum development for compulsory education should be determined in accordance with the needs of the socialist modernization drive as well as the physical and mental development of children and young persons. The revision of the teaching plans and syllabi for the nine-year compulsory programme has been organized by the State Education Commission.

Formally promulgated in 1992, the syllabi and twenty-four curricula began to be used in all primary and middle schools across the country as from the autumn 1993. The new curricula embodied many breakthroughs in curriculum policies, training objectives and curriculum structures. There have been: a shift from the individual disciplinary courses to a combination of disciplinary and activity courses; increased elective courses; adjustments in the ratio between the arts and science; strengthening of a number of courses (sociology, labour skills, music, sports and arts); the introduction of vocational guidance courses; and more emphasis on integrated courses.

In 1998, the contents of primary and middle (lower secondary) school education have been further adjusted with the aim of reducing the difficulty of some teaching subjects and curriculum overloading. To cope with the reform, it has been decided that while the basic uniform teaching requirements should be maintained, teaching materials should be diversified. For this purpose, the State set up a national body to analyze teaching materials and established a system for examining and approving new teaching materials. Several sets of materials were compiled, published and made available to the different regions for their selection. In addition, the provinces (including autonomous regions and centrally controlled municipalities) also compiled sets for electives and local teaching materials. The diversification of teaching materials has enabled the different regions and schools to select the materials in light of the local and school conditions. This has changed the decades-old rigid control over teaching materials and created conditions for deepening the educational reform. (Ministry of Education, 2001).

In 2001, the national authorities issued the Programme of Action for Curriculum Reform of Basic Education (Trial), formulated the curriculum implementation plan for compulsory education and the curriculum standards for various academic subjects, and set up a system of curriculum standards for basic education. These curriculum standards reflect the basic requirements for the students at different educational stages in terms of knowledge and skills, processes and methods, attitudes and values, and specify the nature, goal and framework of various courses, including teaching and assessment strategies. The curriculum reform is mainly aimed to implement quality-oriented education and raise the quality of education. The new curricula highlight the requirements on the innovative spirit and practical abilities of students, attach more attention to cultivation of their initiatives, encourage their creative thinking, explore the interest and potential of youth and teenagers, and foster their curiosity and aspiration to knowledge. Until the autumn of 2005, the new curricula were implemented in the first grade of the primary and secondary schools nationwide, covering more than 100 million students. In 2006, ten

provinces have adopted the new curricula for regular senior secondary schools. (NCEDR, 2008).

Pre-primary education

Pre-primary education caters to children in the age group 3-5 years (three-year programme either full- or part-time) and is offered in kindergartens and preschool classes. Preschool education is the one-year course before the starting of primary education and is aimed at preparing children for school education. In recent years, the State Education Commission has adopted the Rules for the Administration of Kindergartens, the Directive Rules for the Work at Kindergartens, as well as a series of other laws and regulations aimed at promoting the development of preschool education. The local governments, which are the main providers of preschool education, also established and promulgated supporting policies and local regulations and systems. Regional educational authorities also adopted quality standards and evaluation systems for kindergarten education so as to strengthen evaluation and supervision.

Diverse forms of preschool provision have been developed integrating formal and non-formal approaches and combining collective education with family education. In rural areas, preschool education mainly consists of nursery classes and seasonal kindergartens. In remote and poor regions, seasonal classes, week-end classes, tutorial stations, child visit days, home tutorial classes, and other non-formal approaches have been developed to gradually expand the coverage.

In recent years, preschool education in the rural areas—particularly in remote, poor and minority areas—has developed rapidly. Kindergartens combine childcare with teaching so that the children will develop physically, morally, intellectually and aesthetically in a harmonious way to get ready for formal school education. The educational activities in kindergartens constitute a systematic, purposeful and multi-faceted process of education conductive to lively, invigorating and sound development of children. With playing games as the main part of educational activities, a good environment should be created conducive to the education with conditions and opportunities offered to children to live and display their expressiveness.

For preschool classes, instructional time is no more than twelve periods per week and each period is no longer than thirty minutes. No tests or examinations are administered at the preschool level.

According to the Ministry of Education (MOE), by the end of 2002 there were some 111,800 kindergartens nationwide with a combined enrolment of 20.36 million children. According to the UNESCO Institute for Statistics, in 2004 the gross enrolment ratio at the kindergarten level (three-year programme) was estimated at 36%. In 2006, the gross enrolment ratio for children aged 3-6 was estimated at 42.5%. Since 2001, the children-teacher ratio in kindergartens has been decreasing. However, significant differences still exist between the central and western regions and the eastern region and between the urban and the rural. In particular, in rural areas the children-teacher ratio as high as 55: 1, far exceeding the limit set by the government. (NCEDR, 2008).

MOE reports that in 2009 there were 138,209 kindergartens (of which 89,304 were non-state/private) and 867,894 pre-primary classes (395,050 non-state/private), of which 246,121 were preschool classes. The total enrolment was 26.57 million children (including 11.98 million girls), of whom 7.67 million in preschool classes. The total number of staff in kindergartens was 1,570,756, including 141,909 heads of kindergarten, 985,889 full-time teachers (of whom 967,353 females), 123,764 nurses, and 319,194 other staff. In terms of qualifications of kindergarten heads and full-time teachers, 2,053 were graduates, 132,539 were undergraduates, 538,528 had an associate degree, 418,418 were high school graduates, and 36,260 had a qualification below high school graduation. (NBSC, 2010).

Primary education

The nine-year compulsory education programme covers primary and junior secondary education; the entry age is 6 (or 7). In most provinces, the programme is organized into six years of primary and three years of junior secondary education; in other provinces the 5 + 4 pattern is still followed.

The curriculum of primary education comprises academic subjects and practical activities, determined at State and province levels. The curriculum set forth by the State is compulsory. Some schools with the necessary capacities also offer foreign languages teaching. The local curriculum mainly aims at facilitating the local economic and cultural development and is arranged by the educational authorities of provinces, autonomous regions and municipalities under the control of the central government. Schools are authorized to arrange the local curriculum, both in academic and activity aspects, as compulsory or alternative courses.

According to the two patterns of nine-year compulsory education (6+3 or 5+4), the State determines the number of teaching periods per subject for the full-time primary education programme. The weekly lesson timetable for primary education (six- or five-year programme) at the end of the 1990s is presented below:

Primary education (six-year programme): weekly lesson timetable

Subject/activity	Number of weekly periods in each grade					
	I	II	III	IV	V	VI
Subjects:						
Ideology and moral character	1	1	1	1	1	1
Chinese language	10	10	9	8	7	7
Mathematics	4	5	5	5	5	5
Society	–	–	–	2	2	2
Nature	1	1	1	1	2	2
Physical education	2	2	3	3	3	3
Music	3	3	2	2	2	2
Painting	2	2	2	2	2	2
Work	–	–	1	1	1	1
Sub-total	23	24	24	25	25	25
Activities:						
Collective activities	1	1	1	1	1	1
Physical exercise; science, technology and cultural activities	4	4	4	4	4	4
Sub-total	5	5	5	5	5	5
Locally-arranged curriculum	2	2	3	3	3	3
Total weekly periods	**30**	**31**	**32**	**33**	**33**	**33**
Morning/afternoon meeting (ten minutes per day)						

Source: Zhou Wei & Gao Min, 1999. Each teaching period lasts 45 minutes.

Primary education (five-year programme): weekly lesson timetable

Subject/activity	Number of weekly periods in each grade				
	I	II	III	IV	V
Subjects:					
Ideology and moral character	1	1	1	1	1
Chinese language	11	11	9	9	9
Mathematics	5	6	6	6	6
Society	–	–	2	2	2
Nature	1	1	2	2	2
Physical education	2	2	3	3	3
Music	3	3	2	2	2
Painting	2	2	2	2	2
Work	–	–	1	1	1
Sub-total	25	26	28	28	28
Activities:					
Collective activities	1	1	1	1	1
Physical exercise; science, technology and cultural activities	3	3	3	3	3
Sub-total	4	4	4	4	4
Locally-arranged curriculum	2	2	2	2	2
Total weekly periods	31	32	34	34	34
Morning/afternoon meeting (ten minutes per day)					

Source: Zhou Wei & Gao Min, 1999. Each teaching period lasts 45 minutes.

Concerning Hong Kong, Special Administrative Region (SAR) of China, the structure of the education system still reflects the British model, with six years of primary (divided into two three-year cycles, i.e. junior and senior primary or key stages 1 and 2), three years of lower secondary, two years of senior secondary, and two years of post-secondary education (leading to the A-level examination). By 2012, the system will shift to a 6+3+3 pattern. In line with the aims of education and the overall aims of the school curriculum, the Curriculum Development Council had set out the learning goals that students should be able to achieve as follows: (i) recognize their roles and responsibilities as members in the family, the society, the nation; show concern for their well-being; (ii) understand their national identity and be committed to contributing to the nation and society; (iii) develop a habit of reading independently; (iv) engage in discussion actively and confidently in English and Chinese (including Putonghua); (v) develop creative thinking and master independent learning skills (e.g. critical thinking, information technology, innumeracy and self management): (vi). possess a breadth and foundation of knowledge in the eight key learning areas; and (vii) lead a healthy lifestyle and develop an interest in and appreciation of aesthetic and physical activities.

The new *Guide to the Pre-primary Curriculum* (2006) has been fully implemented in all Hong Kong pre-primary institutions since 2007. The Guide emphasizes that early childhood education lays the foundation for lifelong learning and whole person development. The core value of early childhood education lies in "child-centeredness". Pre-primary institutions should formulate their curriculum according to the basic principles of children's development and children's learning. Children's learning interest, needs and abilities should also be taken into consideration. Through play, meaningful life experiences as well as sensory, exploratory and interesting activities, children's holistic development can be fostered. There are four developmental objectives in the curriculum framework for early childhood development, namely: physical development, cognitive and language development, affective and social development, and aesthetic development. These objectives can be achieved through six learning areas, which are: physical fitness and health; language; early mathematics; science and technology; self and society; and arts.

In terms of the *Basic Education Curriculum Guide Primary 1-Secondary 3*, issued in 2002 by the Curriculum Development Council of Hong Kong, all students should be entitled to the following five essential learning experiences for whole-person development: moral and civic education; intellectual development; community service; physical and aesthetic development; and career-related experiences (for junior secondary students). The curriculum framework has three interconnected components: key learning areas, generic skills (collaboration, communication, creativity, critical thinking, information technology, numeracy, problem-solving, self-management, and study skills) and values and attitudes (in particular, responsibility, commitment, respect for others, perseverance, and national identity). The eight key learning areas are: Chinese; English; mathematics; science; technology; personal, social and humanities education; art education; and physical education. At the primary level, the subject 'general studies' provides pupils with a platform to integrate skills, knowledge and values across the key learning areas of personal, social and humanities education, science education, and technology education.

According to the Basic Education Curriculum Guide of 2002, the suggested time allocation over each three-year cycle of primary education is as follows:

Hong Kong, SAR of China. Primary education (P1–P3 and P4-P6): suggested time allocation

Key learning area	Subjects	Suggested time allocation over each three-year cycle
Chinese language education	Chinese language, *putonghua* (standard Chinese)	594-713 hours (25–30%)
English language education	English language	404-499 hours (17–21%)
Mathematics education	Mathematics	285-356 hours (12–15%)
Science education; Technology education; Personal, social and humanities education	General studies	285-356 hours (12–15%)
Arts education	Music, visual arts	238-356 hours (10–15%)
Physical education	Physical education	119-190 hours (5–8%)
Sub-total (over each three-year cycle)		*1,925 hours (81%)*
Flexible time	Provided for: moral and civic education; guidance to complement values education; additional reading time; school assembly; remedial studies; other learning experiences such as community service, co-curricular activities, and aesthetic and physical activities	About 451 hours (19%)
Total over each three-year cycle		**2,376 hours (or 792 hours in each grade)**

Source: Hong Kong Curriculum Development Council, 2002.

As regards Macao (the other Special Administrative Region of China), the table below shows the teaching subjects and the average time allocation at the primary level in 1994:

Macao. Primary education: weekly lesson timetable

Area/Subject	Average number of weekly periods	
	Grades I–IV	Grades V and VI
Desenvolvimento pessoal e social: [Personal and social development] Moral education, civic education, religious education (at least one of these subjects)	1–2	1–2
Aquisições básicas: [Basic skills] Language (first and second language), mathematics	18–20	19–22
Actividades de descoberta: [Discovering the world] Social studies, natural sciences, hygiene and health, history, geography	4–6	5–7
Expressões: [Expressive skills] Aesthetic education, practical activities, music education, physical education	4–8	4–8
Complemento curricular [Additional lessons to be decided by the school]		
Total weekly periods (min.)	**28**	**30**
Total weekly periods (max.)	**38**	**40**

Source: Government of Macao, 1994. The school year consists of 180 working days. Each teaching period lasts 35 to 45 minutes.

In primary and junior secondary schools examinations in China mainland are conducted at the end of each term, at the end of the school year, and for graduation. In the areas where the nine-year compulsory education is implemented, there is no entrance examination for access to junior secondary education.

The population of the 55 ethnic minority groups is over 100 million, accounting for over 8% of the total population of China. The autonomous regions cover 64% of the territory. To ensure the rights of ethnic minority groups to use and develop their own written and spoken languages, the State has implemented bilingual education (using the local language of the ethnic minority and Mandarin) in primary and secondary schools. Trilingual schemes (ethnic minority language, Mandarin and foreign language) have also been trialed. By the end of 2007, bilingual education in Mandarin and 21 ethnic minority languages was carried out in over 10,000 primary and secondary schools, with a total enrolment of over 6 million students. Every year the ethnic minority language teaching materials translation and editing organizations translate, edit and publish over 3,500 teaching materials, with a total number of copies of over 100 million. (MOE, 2008).

The World Bank observes that "literacy rates, enrolment rates, (especially past primary school), and educational attainment rates (especially past junior high school)

are all much lower in rural areas, and while there have been improvements in all these indicators in rural areas in absolute terms, the relative gap between rural and urban areas has continued to widen." "Good progress is being made in universalizing 9-year compulsory education. The waiving of school fees and the provision of boarding subsidies under the compulsory education finance reform, introduced in rural areas in 2006 and gradually extended to urban areas in 2007, is an important step in the right direction. It will also be necessary to ensure that this policy can be implemented through China's decentralized fiscal system on a sustained basis. Poorer local governments (at the provincial and sub-provincial levels) will thus need to be adequately resourced, which in turn will be important for ensuring that free compulsory education does not come at the expense of a compromised quality of education. China has achieved close to universal primary education. But significant inequalities in educational attainment beyond primary school – middle and high school, and eventually tertiary education – remain, and these are an increasingly important source of disadvantage for those who are not well-off. While middle school education is being covered by the compulsory education initiative, there is a need to turn attention to reducing the private costs of high school education especially for the poor. Means-tested subsidies for high school education could be an important future policy initiative, and these could be offered to poor households conditional on school attendance by their children, especially girls. There also remain large differences in the quality of educational inputs across regions, especially across rural and urban areas. Further investments into improving the quality of educational inputs in rural areas will help strengthen the demand and private incentives for education which in turn will be important for addressing the rural-urban education gap." (World Bank, 2009).

According to the Ministry of Education, the net enrolment ratio was estimated at 98.6% in 2002. The total number of full-time primary school teachers was 5,778,900. The transition rate to junior secondary school was estimated at 97% (98.4% in 2007). In 2007, the net enrolment ratio at the primary level reached 99.5% and the gross enrolment ratio for junior middle school education was estimated at 98%. (MOE, 2008).

There is a big gap between urban and rural areas, and regional educational levels. By the end of 2007, there were still 42 counties in the west China which had not fulfilled the "two basics", e.g. universalizing the nine-year compulsory education and eliminating illiteracy among young people and adults. (MOE, 2008).

MOE reports that in 2009 there were 100,714,661 pupils (of whom 46,604,874 girls) enrolled in 280,184 primary schools; there were also 72,483 external teaching sites. The total number of staff at the primary level was 6,135,536, including 5,633,447 full-time teachers (of whom 3,217,059 females), 237,699 administrative staff, 106,191 teaching auxiliaries, 156,216 workers, and 1,983 employees in school-run factories and farms. In terms of qualifications of full-time teachers, 4,684 were graduates, 1,110,503 were undergraduates, 3,100,558 had an associate degree, 1,384,082 were high school graduates, and 33,620 had a qualification below high school graduation. The average pupils-teacher ratio was 17.8:1 in 2009.

As regards special education, in 2009 there were 1,672 special education schools with a total of 47,466 staff (including 37,945 full-time teachers) and 428,125

students enrolled (mainly in grades 1-9). In 2007, it was estimated that some 223,000 school-age disabled were not in school; 54% of the teachers had special education qualifications. (MOE, 2008). Concerning adult education, there were 2,108,199 persons enrolled in adult primary schools and 1,148,550 in literacy courses. (NBSC, 2010).

Secondary education

Depending on the structure of the nine-year compulsory education programme (6+3 or 5+4), the State determines the number of teaching periods per subject for the full-time junior secondary education programme. The weekly lesson timetable for junior secondary education at the end of the 1990s is shown below:

Lower secondary education (three-year programme): weekly lesson timetable

Subject activity	Number of weekly periods in each form		
	I	II	III
Subjects:			
Ideology and politics	2	2	2
Chinese language	6	6	5
Mathematics	5	5	5
Foreign language (Level II)	4	4	4(*)
History	2	3	2
Geography	3	2	–
Physics	–	2	3
Chemistry	–	–	3
Biology	3	2	–
Physical education	3	3	3
Music	1	1	1
Painting	1	1	1
Work skills	2	2	2
Sub-total	32	33	31
Activities:			
Collective activities	1	1	1
Physical exercise; science, technology and cultural activities	3	3	3
Sub-total	4	4	4
Locally-arranged curriculum	–	–	1(*)
Total weekly periods	**36**	**37**	**36**
Morning/afternoon meeting (ten minutes per day)			

Source: Zhou Wei & Gao Min, 1999. (*) The course foreign language at level I is offered in Forms I and II only (four weekly periods); in Form III, four additional weekly periods are allocated to the locally-arranged curriculum. Each teaching period lasts 45 minutes.

Lower secondary education (four-year programme): weekly lesson timetable

Subject/activity	Number of weekly periods in each grade				
	I	II	III	IV	V
Subjects:					
Ideology and moral character	1	1	1	1	1
Chinese language	11	11	9	9	9
Mathematics	5	6	6	6	6
Society	–	–	2	2	2
Nature	1	1	2	2	2
Physical education	2	2	3	3	3
Music	3	3	2	2	2
Painting	2	2	2	2	2
Work	–	–	1	1	1
Sub-total	25	26	28	28	28
Activities:					
Collective activities	1	1	1	1	1
Physical exercise; science, technology and cultural activities	3	3	3	3	3
Sub-total	4	4	4	4	4
Locally-arranged curriculum	2	2	2	2	2
Total weekly periods	**31**	**32**	**34**	**34**	**34**
Morning/afternoon meeting (ten minutes per day)					

Source: Zhou Wei & Gao Min, 1999. Each teaching period lasts 45 minutes.

Concerning Hong Kong, according to the Basic Education Curriculum Guide of 2002 the suggested time allocation over the three-year junior secondary education is as follows:

Hong Kong, SAR of China. Junior secondary education (S1–S3): suggested time allocation

Key learning area	Suggested time allocation over S1-S3
Chinese language education	468-578 hours (17–21%)
English language education	468-578 hours (17–21%)
Mathematics education	331-413 hours (12–15%)
Science education*	276-413 hours (10–15%)
Technology education*	220-413 hours (8–15%)
Personal, social and humanities education*	413-551 hours (15–20%)
Arts education (music and visual arts)	220-276 hours (8–10%)
Physical education	138-220 hours (5–8%)
Sub-total (over the three-year cycle)	*2,534 hours (92%)*
Flexible time (provided for: moral and civic education; guidance to complement values education; additional reading time; school assembly; remedial studies; other learning experiences such as community service, co-curricular activities, and aesthetic and physical activities)	About 220 hours (8%)
Total over the three-year cycle	**2,754 hours (or 918 hours in each grade)**

Source: Hong Kong Curriculum Development Council, 2002. (*) Suggested time allocation for schools whose curriculum has not a technology education orientation.

Under the key learning area 'technology education' the following subjects can be offered: automobile technology; business fundamentals; catering services; computer literacy; design fundamentals; design & technology; desktop publishing; electronics & electricity; fashion design; graphical communication; home economics / technology and living; retail merchandising; and technology fundamentals. The key learning area 'personal, social and humanities education' includes the following subjects: Chinese history; civic education; economic & public affairs; geography; history; religious education; and social studies.

Hong Kong started to implement the new senior secondary curriculum (S4-S6) in September 2009. The new curriculum framework is designed to enable students to attain the following learning goals for whole-person development and stretch the potential of each student: (i) to be biliterate and trilingual with adequate proficiency; (ii) to acquire a broad knowledge base, and be able to understand contemporary issues that may impact on their daily life at personal, community, national and global levels; (iii) to be an informed and responsible citizen with a sense of global and national identity; (iv) to respect pluralism of cultures and views, and be a critical, reflective

and independent thinker; (v) to acquire information technology and other skills as necessary for being a lifelong learner; (vi) to understand their own career/academic aspirations and develop positive attitudes towards work and learning; (vii) to lead a healthy life-style with active participation in aesthetic and physical activities. The SS curriculum is an extension of the curriculum in basic education (e.g. primary and junior secondary education). It promotes students' learning to learn capabilities. It is broad and balanced, and is developed from prior knowledge of the eight key learning areas and the learning experiences of students gained in their basic education with an emphasis on positive values and attitudes.

The SS curriculum is made up of three components, namely core subjects, elective subjects, and other learning experiences; it covers a total of 2,700 hours of lesson time over three years.. Core subjects for all students are: Chinese language, English language, mathematics and liberal studies (45-55% of time allocation); liberal studies include independent enquiry study and six modules: personal development and interpersonal relationship; Hong Kong today; modern China; globalization; public health; energy, technology and the environment. Students must choose two or three electives among 20 subjects, a range of applied learning courses and other languages (20-30% of time allocation). Other learning experiences include: moral and civic education, community service, aesthetic development, physical development, and career-related experience (15-35% of learning time). Applied learning courses cover six areas, namely: applied science; business, management and law; creative studies; engineering and production; media and communication; and services. They aim to develop students' basic skills, thinking abilities, interpersonal relationships, values, attitudes and career-related abilities necessary to prepare them for further studies, work and life-long learning. The Hong Kong Diploma of Secondary Education will record the learning outcomes of applied learning course(s) and give recognition to students' level of performance by two levels, i.e. 'attained' and 'attained with distinction'. The new system will be 'standards-referenced', i.e. students' performance will be compared to a pre-defined standard. There will be five levels and each level will be accompanied by descriptors that make it clear what a typical student at a given level is able to do.

According to the Senior Secondary Curriculum Guide of 2009 the suggested time allocation over the new three-year senior secondary education is as follows:

Hong Kong, SAR of China. New senior secondary education (S4–S6) curriculum: suggested time allocation

Component	Suggested time allocation over S4-S6
Core subjects:	
Chinese language	338-405 hours (12.5-15%)
English language	338-405 hours (12.5-15%)
Mathematics	270-405 hours (10–15%)
Liberal studies	270 hours (min. 10%)
Elective subjects (2-3 subjects, min. 270 hours per subject)	540-810 hours (20-30%)
Other learning experiences:	
Aesthetic development	135 hours (5%)
Physical development	135 hours (5%)
Moral and civic education, community service and career-related experiences	135 hours (5%)
Total over the three-year cycle	**2,700 hours (or 900 hours in each grade)**

Source: Hong Kong Education Bureau. *Senior secondary curriculum guide. The future is now: From vision to realization.* Provisional final draft. May 2009.

In China mainland, students completing senior (general) secondary education sit the final examination (administered by the provincial authorities) in nine subjects: politics, Chinese, mathematics, a foreign language (normally English, but it may be also Japanese, Russian, French or German), physics, chemistry, biology, history and geography. Students also sit practical examinations in physics, chemistry and biology, and are assessed on their moral, ideological and political development. Successful students are awarded the senior middle school graduation certificate. In 2002, the Ministry of Education introduced changes to the examination system with the aim to have the new system nationally in place by 2010. A credits system has been introduced in the three years of senior secondary education, and students must obtain a total of 144 credits in order to complete the programme (116 from compulsory subjects and 28 from electives). New subjects have also been introduced into the curriculum, including research skills, social service, social work experience placements, physical education, and art subjects. Each subject is made up of various 36-hour modules which are worth two credits, except for the art and physical education modules (one credit). Subjects are also subdivided into eight areas of study, namely: language and culture; mathematics; humanities and society; science; technology; arts; physical education and health; and a combination of practical activities. A distinction is now drawn between compulsory and elective subjects. One hundred points can be obtained for each subject (sometimes less for electives, this differs between provinces). The points score is then converted into a letter according to a slightly modified assessment system made up of four letters, A standing for 'excellent' (100-85), B for good (84-70), C for satisfactory (69-60), and D for unsatisfactory (59-0). The examination is conducted twice per year, and students can sit the exam from the second year of senior middle school onwards (except for the

three compulsory subjects of Chinese, mathematics and foreign language; these must be examined in the third year). The highest score obtained in any subject is the one that counts. The results for electives are only valid for the same year, as opposed to the results of compulsory subjects, which are valid for three years. (NUFFIC, 2010).

Vocational education is provided at three levels: junior secondary, senior secondary and tertiary. Junior vocational education refers to vocational programmes after primary education and is part of the nine-year compulsory education. Junior vocational schools mainly provide workers, peasants and employees with basic professional knowledge and certain professional skills. Vocational programmes at this level usually last three to four years. Junior vocational schools are generally located in rural areas where the economy is less developed.

Secondary vocational education plays a guiding role in training manpower with practical skills. The network consists of specialized secondary schools, schools for skilled workers and vocational high schools. Junior secondary school graduates can enter specialized secondary schools (e.g. secondary technical schools and normal schools) where the duration of studies is usually four years—three years in some cases. A few specialties are open only to graduates from senior high school, and the duration of programmes is two years. Schools for skilled workers and vocational high schools enrol graduates from junior secondary and programmes normally last three years. Their main task is to train secondary-level, practice-oriented talents with comprehensive professional abilities and all round qualities directly engaged in the forefront of production, service, technology and management. Accordingly, the specialties offered in vocational high schools are mainly related to the third industry.

Post-secondary vocational education is offered to graduates from senior secondary schools and secondary vocational schools; the duration of programmes is two to three years. In recent years, the proportion of graduates form secondary vocational schools has increased, gradually establishing a link between secondary and tertiary vocational education. Aiming at training secondary and high-level specialized technical and management talents needed in the economic construction, tertiary vocational education emphasizes the training of practice-oriented and craft-oriented talents. Educational establishments providing tertiary vocational education are divided into four categories: higher vocational technology institutions; five-year higher vocational classes provided in the regular specialized secondary schools; tertiary vocational education provided in some regular higher education institutions and adult higher education institutions; and reformed regular institutions offering two- to three-year higher education courses with the emphasis on training practice-oriented talents, namely high-level professional technical talents.

Measures have been taken to establish a system of double certificates oriented to vocational education. When students receive their diplomas, the authorities concerned will check their skills in accordance with their specialties and then the qualified students will receive the vocational qualification certificate or the technical-grade certificate. These measures have been implemented in schools for skilled workers and senior secondary vocational schools.

A wide range of vocational training courses have been playing a more important role in vocational education. Vocational training is mainly conducted and

managed by the departments of education and labour, but enterprises are encouraged to provide vocational training for their own employees. In 2001, short-term training courses involved the equivalent of 100 million person-time (150 million in 2005). (NCEDR, 2008).

According to the Ministry of Education, by 2002 in China there were 65,600 junior secondary schools with a total enrolment of 66,874,300 students; the number of full-time teachers was 3,467,700. The net enrolment ratio was estimated at 90% and the transition rate to senior secondary was estimated at 58%.

MOE reports that in 2009 there were 70,774 regular secondary schools, of which 14,607 senior secondary schools (including 6,476 senior secondary schools and 8,131 complete secondary schools offering six years of secondary education), and 56,167 junior secondary schools (including 43,744 junior secondary schools and 12,423 nine-year schools offering combined primary and junior secondary education). Concerning vocational education, there were 3,789 regular specialized secondary schools, 5,652 vocational senior secondary schools, 3,077 technical schools, and 153 vocational junior secondary schools.

The total enrolment at the secondary level was as follows: 54.33 million students (of whom 25.74 million girls) in regular junior secondary schools; 24.34 million students (of whom 11.73 million girls) in regular senior secondary schools; 8.404 million students in regular specialized secondary schools; 7.78 million students in vocational senior secondary schools; 4.15 million students in technical schools; and 72,995 students enrolled in vocational junior secondary schools. Concerning adult education, there were 487,876 persons enrolled in 1,558 adult junior secondary schools, 1,509,942 in 1,883 adult specialized secondary schools, and 114,676 in 753 adult senior secondary schools.

The breakdown of full-time secondary teachers in 2009 was as follows: 3,513,438 teachers in junior secondary schools; 1,497,687 in senior secondary schools; 272,270 in specialized secondary schools; 321,511 in vocational senior secondary schools; 186,432 in technical schools; and 4,571 in vocational junior secondary schools. In the same year, the average students-teacher ratio was 15.4:1 in junior secondary, 16.3:1 in senior secondary, 23.6:1 in vocational senior secondary, and 27.8:1 in specialized secondary schools. (NBSC, 2010).

Assessing learning achievement nationwide

The assessment of the teaching quality in schools has been strengthened. Schools are required to establish a mechanism of assessment that prioritizes their self-assessment but also calls for joint participation by the departments of educational administration, departments of supervision, students, parents, and communities. The intensification of both internal and external school assessments aims to know better their situations and take measures to tackle the existing problems, so as to raise their educational quality in a comprehensive manner. Currently, the country is working to build the basic education monitoring network at four levels, (the national, provincial, prefecture, and county levels), and the Ministry of Education has established a new Center for Monitoring the Quality of Basic Education. (NCEDR, 2008).

The *Outline of China's National Plan for Medium- and Long-term Education Reform and Development* (2010-2020) stipulates that the quality of compulsory education shall be improved. Basic national standards and a monitoring system for the quality of compulsory education shall be established. (MOE, 2010).

Shanghai (the largest city in China and one of the four municipalities with the status of province as Beijing, Tianjin and Chongqing)) participated for the first time in the 2009 OECD's Programme for International Student Assessment (PISA) of 15-year-old students in reading, mathematical and scientific literacy which involved 65 countries/economies. The sample consisted of 5,115 students in 152 schools. The city achieved very high average results overall, ranking first internationally in reading, mathematics and science. Hong Kong participated in the second round of PISA 2000 (2002/03), as well as in 2006 and 2009. Concerning PISA 2003, the sample consisted of 4,405 students from 140 schools including government, aided and independent schools. Overall, students in Hong Kong performed well internationally, ranking first in mathematics, third in science, and sixth in reading among the participating countries. Hong Kong also participated in the Progress in International Reading Literacy Study (PIRLS) conducted under the auspices of the International Association for the Evaluation of Education, and in the Trends in International Mathematics and Science Study (TIMSS).

Teaching staff

A system of teacher's professional titles has been implemented. At higher education institutions, teacher positions include: professor, assistant professor, lecturer and assistant lecturer. Teacher positions at specialized secondary schools include: senior lecturer, lecturer, assistant lecturer and teacher. Teacher positions for cultural and technical theory at skilled workers schools include: senior lecturer, lecturer, assistant lecturer and teacher. Titles of practice-guiding teachers in skilled worker schools and vocational secondary schools are senior practice-guiding teacher, first-rank practice-guiding teacher, second-rank, and third-rank practice-guiding teacher. Teacher positions at general secondary schools include: senior secondary school teacher, first-rank secondary school teacher, second-rank, and third-rank secondary teacher. Teacher positions at primary schools and kindergartens are: senior primary school (or kindergarten) teachers, first-rank primary school teacher, second-rank, and third-rank primary teacher.

In accordance with the regulations of the central government, schools are authorized to manage their teachers independently. Within the State-formulated establishment ceilings, schools independently decide upon the employment of teaching and supporting staff, the terms of employment and methods of selection (although the method generally adopted is choosing the best candidates, following comprehensive examinations). The State sets annual quotas for schools of various kinds and at various levels. Those that fit the post qualifications and gain the approval of the selection and examination organs are recruited as teachers.

The qualification system for teachers is the legal system which gives permits for the teachers to practice. It stipulates the titles, types, the scope of application of teachers' qualifications, the requirements for different kinds of teachers, the examinations for teacher qualification, the confirmation of the teachers' qualification,

and their legal liabilities. The requirements for teacher status are a vital part of the teacher qualification system. To acquire a teacher's certificate, the following requirements must be met:

- Citizenship. to be qualified as a Chinese teacher, one must first be a Chinese citizen; on the other hand, any Chinese citizen, regardless of ethnic origin, sex, or occupation, can acquire a teacher status provided that he or she meets all the qualifications requirements.
- Ethical requirements. to apply for a teacher's certificate, one has to be sound ideologically and politically; this is a basic requirement for teachers determined by the socialist nature of education in the country.
- Academic requirements: for different levels of teachers' qualifications the requirements are as follows: (i) graduates from infant normal schools for preschool education or above (teachers in nurseries and kindergartens); (ii) graduates from secondary normal schools or above (teachers in primary schools): (iii) graduates from two- or three-year specialized higher normal school or other colleges or above (teachers of junior middle schools or teachers who teach general academic and specialized courses in primary vocational schools): (iv) graduates from normal college or other universities and four-year colleges or above (teachers in senior middle schools or teachers who teach general academic and specialized courses in senior vocational schools, technical schools, or vocational high schools): (v) university graduates or postgraduates (teachers of institutions of higher learning); (vi) graduates from institutions of higher learning or secondary schools or above (teachers of adult education in accordance with the different levels and types of adult education involved).
- Educational and teaching skills: In order to select correctly the educational or teaching content and method, design the teaching programme scientifically, and conduct educational and teaching activities effectively, a teacher must have: a good command of pedagogic and psychological laws; a reasonably good articulation and ability to handle the students; an ability to conduct scientific research, so as to improve the teaching content and method and raise the teaching standard; and a good physique needed for conducting teaching activities.

Due to the numbers of secondary and primary school teachers, teacher training is a shared responsibility of various education administrative organs at different levels. The education administrative organs formulate policies, provide financial support, define training programmes and methods for management and examination, and sum up and spread good practices in a timely manner. Training institutions collaborate with the organs responsible for education research in organizing training activities systematically, providing professional guidance and management for training activities and conducting training research. Schools where teachers work are the prime places for teacher training. They should provide time for training and necessary material conditions for a systematic, permanent and effective training.

The State Education Commission is responsible for the macro-guidance of teacher training for the higher education institutions, overseeing the teacher training institutions. The education administrative organs of the provinces, autonomous regions and municipalities are responsible for the pre-service and in-service teacher

training for the local higher education institutions and for coordinating teacher training with higher education institutions located within their regions, but attached to the ministries of the central government. Higher education institutions are responsible for their own teacher training (e.g. formulation of plans, concrete arrangement for teachers' advanced studies on teaching theories and practices, and sending teachers abroad for further studies). There has been a process of merging and upgrading of the existing institutions during 1992-2005, which finally resulted in 475 institutions involved in teacher training, including 183 normal (teacher training) colleges and universities, 34 independent teacher training institutes, and 258 general colleges and universities offering teacher education programmes by the end of 2005.

Prior to their employment, nursery and kindergarten teachers must: follow specialized courses at secondary normal schools for preschool education; acquire general and scientific knowledge and skills needed for undertaking nursery and kindergarten work; learn about laws and characteristics of preschool children's physiological and psychological development; master basic knowledge and skills in childcare and education; develop some knowledge about how to conduct research on preschool education; develop the ability to increase social contacts and bring the initiative of the family and society of the preschool children into full play; learn how to observe and understand preschool children's behaviour; and learn how to set objectives for child care and education, to organize games and other educational activities for children, and to manage the class and nursery or kindergarten.

Before they start working, primary school teachers must: acquire a specialized education in politics, general literacy and scientific knowledge, educational theories, art, physical culture, and labour skills in secondary normal or other schools or above. They must also obtain job training which includes: an effort to inspire their dedication to primary school education; instructions on related laws; regulations and policies; developing familiarity with the teaching and general educational theories; and mastering teaching methods for different courses (if the students are non-normal school graduates).

Prior to employment, teachers of secondary schools must receive an education in: politics, physical culture, basic theories of specialized courses, basic knowledge and skills, pedagogy, psychology, and develop basic knowledge and skills about methodologies of specific courses in normal universities or other and in schools of higher learning. Prior to employment, university and college teachers must receive training, especially those undergraduates and post-graduates who immediately start working as assistants and lectures respectively after finishing their studies.

The main forms of in-service training for primary and secondary school teachers are as follows:

- Systematically send teachers to teacher training schools for advanced studies or normal schools at different levels with the purpose of making them qualify for a certain academic status.
- Apply a training model which combines correspondence and satellite TV education with a national examination system for self-taught students.

- Offer the chance for junior middle school teachers to take the courses in two-year programmes of normal universities though self-study and acquire qualifications through a series of examinations.
- Encourage teachers to study while working. Encourage them to improve their competence in teaching in close connection with their teaching practice and in all possible forms: to be trained by the school itself, to learn through research work, to require the veteran teachers help the young (or to encourage them in self-directed teaching).
- Require the government educational authorities sponsor all kinds of training programmes and get teachers together for intense training.
- Require schools at various levels which are authorized to undertake teachers' training, to offer training in accordance with specific plans for teachers of primary and middle schools who are: new on their jobs, need training for their specific posts, are the backbones of the school, or need more education to meet the qualifications for a higher academic title.

The main forms of in-service training for university and college teachers are:

- Offer the chance to take a specified course to those who are preparing themselves to teach that course.
- Offer the chance for young teachers (who still have not been conferred an M.A. or M.S. degree) to apply for an M.A., M.S., or Ph.D. thereby becoming candidates equivalent to post-graduates.
- Allow teachers to receive advanced training as visiting scholars in domestic institutions of higher learning. This is an important way to train academic leaders as well as an effective channel to promote intercollegiate academic exchanges.
- Offer advanced studies programmes for backbone teachers, mainly intended for young teachers with two years' or above teaching experience.
- Offer short academic conferences or lectures. This is the way teachers get together in order to learn from, and exchange views with, each other and discuss the new developments, achievements, as well as problems that need to be solved in a certain academic field.
- Send some teachers, mainly young and middle-aged *backbones*, overseas for further studies.
- Offer advance academic conferences for the purpose of training new academic leaders and *backbones* in specific fields so as to fulfil the strategic task of completing the "change of guards", where the young take over the tasks from the old.

The workload of teachers at the compulsory education level is primarily the responsibility of the local authorities, under the macro-guidance of the central government. Generally speaking, the number of teaching hours for senior secondary school teachers is 10 to 14 hours per week: for junior secondary school teachers, 12 to 16 weekly hours; and for primary school teachers, 16 to 22 hours per week. The localities determine the number of teaching hours for extra-curricular classes, according to local conditions. The workload for teachers at higher education institutions is determined by the institutions themselves.

The leveled-salary is practiced both for teaching and support staff. Salaries are composed of two parts: post salary and allowances. The allowances account for 30% of the total salary and the grade of post salary is determined on the basis of: performance, duration of employment, record of schooling, etc.

In accordance with the Teacher Law, the main material benefits include: (i) teachers average salary shall not be lower or higher than that of the State public servants and shall be raised gradually; (ii) teachers of primary and middle schools and vocational schools enjoy subsidies, primarily in accordance with the length of their teaching; (iii) local people's governments at all levels, and the departments concerned under the State Council, shall give priority and preferential treatment to teachers in the construction, renting and sales of the houses in urban areas; (iv) teachers enjoy equal medical care treatment as the State public servants of the localities: they shall be given regular health check-ups and enjoy recuperation holidays, organized in line with actual local conditions: (v) after retiring or resigning from posts, teachers enjoy the retirement or resignation treatment as stipulated by the State: local people's governments above the county level can appropriately raise the pensions for the retired primary and middle school teachers who have long been engaged in education and teaching; (vi) measures shall be adopted to improve the treatment of the teachers who receive state subsidies and are paid by the collectives, so that they can enjoy equal pay for equal work just as the teachers who are paid by the State. The Constitution provides that female teachers enjoy the same equal rights and treatment as their male counterparts.

Following the salary reform in 1993, the overall salary level of teachers registered a substantial gain. The retirement benefits have risen for teachers in over twenty provinces, autonomous regions and municipalities to the extent that secondary and primary school teachers who have had a teaching career of 30 years (25 years for female teachers) shall have a pension of the same amount as their salary.

The training of university presidents is mainly entrusted by the State Education Commission to the National Academy of Educational Administration (NAEA). The main content includes: the development strategies and policies in the field of society, economy, science and technology, and education; the reform and development policies of higher education, educational laws and regulations: theories and practice of school management: world trends in promoting and organizing scientific research and higher education reforms. The pre-service training of educational inspectors is handled at two levels. First, under direct leadership of the central government, the State Education Commission (in collaboration with the municipality) is responsible for the training of inspectors at the precinct and city levels. Second, under the direct leadership of the central government, the educational authorities of autonomous regions, provinces, and municipalities are responsible for the training of county and district inspectors. The main content of the inspectors' training includes: selected lectures on Marxist philosophy; basic educational theories; general theory on educational management; educational inspection and evaluation; educational laws, regulations and policies; and various kinds of inspections. By the end of 1994, about 43.5% of the nation's inspectors had received pre-service training. (Ministry of Education, 2001).

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For updated links, consult the Web page of the International Bureau of Education of UNESCO: http://www.ibe.unesco.org/links.htm

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A Chinese Education, for a Price

By DAN LEVIN

BEIJING — For Chinese children and their devoted parents, education has long been seen as the key to getting ahead in a highly competitive society. But just as money and power grease business deals and civil servant promotions, the academic race here is increasingly rigged in favor of the wealthy and well connected, who pay large sums and use connections to give their children an edge at government-run schools.

Nearly everything has a price, parents and educators say, from school admissions and placement in top classes to leadership positions in Communist youth groups. Even front-row seats near the blackboard or a post as class monitor are up for sale.

Zhao Hua, a migrant from Hebei Province who owns a small electronics business here, said she was forced to deposit $4,800 into a bank account to enroll her daughter in a Beijing elementary school. At the bank, she said, she was stunned to encounter officials from the district education committee armed with a list of students and how much each family had to pay. Later, school officials made her sign a document saying the fee was a voluntary "donation."

"Of course I knew it was illegal," she said. "But if you don't pay, your child will go nowhere."

Bribery has become so rife that Xi Jinping devoted his first speech after being named the Communist Party's new leader this month to warning the Politburo that corruption could lead to the collapse of the party and the state if left unchecked. Indeed, ordinary Chinese have become inured to a certain level of official malfeasance in business and politics.

But the lack of integrity among educators and school administrators is especially dispiriting, said Li Mao, an educational consultant in Beijing. "It's much more upsetting when it happens with teachers because our expectations of them are so much higher," he said.

Affluent parents in the United States and around the world commonly seek to provide their children every advantage, of course, including paying for tutors and test preparation courses, and sometimes turning to private schools willing to accept wealthy students despite poor grades.

But critics say China's state-run education system — promoted as the hallmark of Communist meritocracy — is being overrun by bribery and cronyism. Such corruption has broadened the gulf between the haves and have-nots as Chinese families see their hopes for the future sold to the highest bidder.

"Corruption is pervasive in every part of Chinese society, and education is no exception," Mr. Li said.

It begins even before the first day of school as the competition for admission to elite schools has created a lucrative side business for school officials and those connected to them.

Each spring, the Clean China Kindergarten, which is affiliated with the prestigious Tsinghua University and situated on its manicured campus in Beijing, receives a flood of requests from parents who see enrollment there as a conduit into one of China's best universities. Officially, the school is open only to children of Tsinghua faculty. But for the right price — about 150,000 renminbi, or about $24,000, according to a staff member who spoke on the condition of anonymity to avoid retaliation — a Tsinghua professor can be persuaded to "sponsor" an applicant.

Parents with less direct connections have to bribe a chain of people for their child to be admitted to the kindergarten. "The more removed you are from the school, the more money you need," the staff member said. "It can really add up."

A school official denied that outsiders could pay their way in.

The costs can increase as college gets closer. Chinese news media reported recently that the going bribery rate for admission to a high school linked to the renowned Renmin University in Beijing is $80,000 to $130,000.

Government officials have also found a way to game the system. The 21st Century Business Herald, a state-run newspaper, reported that powerful agencies and state-owned enterprises frequently donated to top schools under what is known as a "joint development" policy. In exchange, education reformers say, the children of their employees are given an admissions advantage.

The same practice has been taken up by private companies that provide "corporate sponsorships" to top schools.

In China, education through junior high school is mandatory, and free, but the reality is often more complicated. As a child grows up, parents lacking connections must pay repeatedly for better educational opportunities. Across the country, such payments take the

form of "school choice" fees that open the door to schools outside the district or town listed on a family's official residency permit.

These illegal fees are especially onerous for the millions of struggling migrant workers who have moved to distant cites. The Ministry of Education and the State Council, China's cabinet, have officially banned "school choice" and other unregulated fees five times since 2005, yet school officials and relevant government departments keep finding creative ways around the ban, allowing them to keep the cash flowing.

At some top-ranked high schools, students with low admission test scores can "buy" a few crucial points that put them over the threshold for admission. According to an unwritten but widely known policy at one elite Beijing high school, students receive an extra point for each $4,800 their parents contribute to the school. "All my classmates know about it," said Polly Wang, 15, a student who asked that the school not be named to avoid repercussion.

Surrounded by a culture where cash is king, teachers often find their own ways to make up for their dismal salaries. Qin Liwen, a journalist who writes about education, said that some instructors run cram schools on the side and encourage attendance by failing to teach their students a vital chunk of the curriculum during the school day.

"Why do something for free when everyone is paying you?" Ms. Qin said. Faced with the prospect of their child's missing critical material or incurring the teacher's wrath, many parents feel compelled to pay for these extra courses, she said.

The culture of brown-nosing becomes a costly competition during Teacher Appreciation Day, a national holiday in September, when students of all ages are expected to bring gifts. Gone are the days when a floral bouquet or fruit basket would suffice. According to reports in the Chinese news media, many teachers now expect to be given designer watches, expensive teas, gift cards and even vacations. In Inner Mongolia, some parents said, more assertive teachers welcome debit cards attached to bank accounts that can be replenished throughout the year.

The value of such gifts, the newspaper Shanghai Daily estimated, has grown 50 times from a decade ago.

"It's a vicious cycle," said Ms. Zhao, the owner of the Beijing electronics business and parent of a 10-year-old girl. "If you don't give a nice present and the other parents do, you're afraid the teacher will pay less attention to your kid."

Poor students are the most vulnerable in this culture of bribery. Bao Hong, 33, a maid in Beijing, used to think her 7-year-old daughter, Rui, was having a tough time at school because she was reared in the countryside by her grandparents. Ms. Bao now blames her teachers.

Last year, she said, a teacher slapped her daughter and called her "stupid." In the spring, the teacher stopped grading Rui's homework and then skipped a mandatory home visit. "My daughter's discriminated against because we don't make much money," Ms. Bao said, standing outside the room she rents with her husband, a street cleaner.

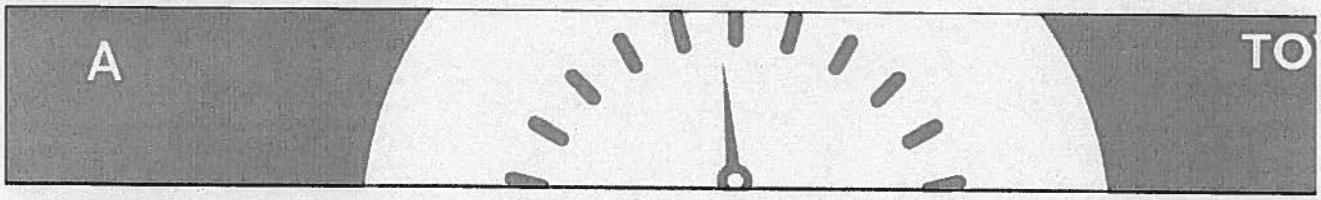
Some parents have found that the only way to preserve any integrity is to reject a Chinese education altogether. Disgusted by the endemic bribery, Wang Ping, 37, a bar owner in Beijing, decided to send her son abroad for his education. In August, she wept as she waved goodbye to her only child, whom she had enrolled at a public high school in Iowa.

"China's education system is unfair to children from the very beginning of their lives," she said. "I don't want my son to have anything more to do with it."

Shi Da and Mia Li contributed research.

TIME

SHANGHAI SURPRISE: DON'T SWEAT GLOBAL TEST DATA
1/20/2011



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TIME

Thursday, Jan. 20, 2011

Shanghai Surprise: Don't Sweat Global Test Data

By Andrew J. Rotherham

Concern about falling behind internationally is one of America's most popular education anxieties. This week's Washington visit by Chinese President Hu Jintao and all the chatter about Amy Chua's new book on why Chinese-style "tiger moms" raise more successful children than Americans do serve as uncomfortable reminders that the kids in Shanghai did astronomically well on a set of international tests released last month, whereas U.S. kids came in 17th.

That makes us sound pretty lame. But the extremists at both ends of the education spectrum — i.e., those telling us international tests are meaningless and those claiming the scores are a sure sign that the sky is falling — are wrong. Here are five reasons you should ignore the hysterical commentary, followed by a commonsense look at what you should care about instead). (See " 'Tiger Mother': Are Chinese Moms Really So Different?")

1. Although the results of international tests are generally presented as an absolute ranking, often the differences between specific countries are not that substantial. For instance, when you look at the scores released last month by the Program for International Student Assessment (PISA), which is conducted by the Organization for Economic Cooperation and Development, the U.S. was in the middle of the pack in science and reading and lagged in math. No, we didn't do as well as we should, but we were ahead of countries like Germany, France and England.

2. It was Shanghai — not all of China — that received top honors on the PISA test. And Shanghai is where the smartest kids in the country go to school. So drawing the breathless conclusions as the media has about China and the PISA data is not unlike taking all the college kids in Cambridge, Mass., home to Harvard and MIT, and declaring them to be a representative sample

of higher education across the U.S. When we start testing rural China, we'll get a more accurate picture of what we're really up against.

3. There are differences between countries that international assessments fail to capture. The American educational system is remarkable for the second chances it offers students who struggle in school. If you have to repeat a grade, we don't tell you that you can never go to college. Likewise, if you fail a test, it doesn't automatically put you on a different life path. Even in some industrialized nations, high-stakes tests mean a lot of kids get kicked to the curb. That's not our way. (See five things the U.S. can learn from China.)

4. It's worth remembering that during the Cold War, we feared Soviet domination. When I was in school, we were told it was the Japanese who would be our undoing. Yet you don't hear much about Russia anymore, and American policymakers today are scrambling to avoid a "Japanese decade" like the economically anemic one that country had in the '90s. Much like the disclaimer on a mutual fund, past performance in addressing competitive challenges is not a guarantee of future success. So we can't afford to become complacent, but we should maintain some perspective.

5. The 20th century was clearly the American century, but that wasn't necessarily because of the superior quality of our schools. A variety of societal factors such as immigration, a stable government and legal system, respect for property rights and contracts, and openness to trade matter to competitiveness too. Stanford University economist Eric Hanushek examined international test score data, and what he found should both hearten and worry us. When he crunched the numbers, he concluded that learning — and crucially, not just years in school but how much students actually learned — does matter to a country's economic growth. But the relationship, while quite significant, was not as pronounced when he accounted for some societal factors. In other words, we won't rise or fall on schools alone.

So what's the takeaway? It's clearly better to do well on these assessments than poorly. (Hanushek also found that improving performance on these tests would be reflected in our national economic performance.) And it is certainly troubling that we are not producing as many students who perform at the top of these assessments as some other countries are. But this is a long-term (and solvable) problem — even as we compete with countries like China that can swamp us in terms of population. (See "China Beats Out Finland for Top Marks in Education.")

More immediately, rather than obsessing about international comparisons, we should focus on the data here at home, where there is a genuine educational crisis. Only about 6 in 10 African-

American and Hispanic students are graduating from high school. Meanwhile, enormous gaps in achievement exist on state tests as well as our national assessments and other measures, like the SAT. Minority students are also more likely to be in special education and less likely to be in gifted education programs than other students. And remember: America will be a majority–minority country before 2050, according to the U.S. Census Bureau.

What this means is that if we want to become more competitive internationally, our future engineers and scientists will not come from the students who today are choosing other white-collar professions. Instead, they will have to come from the students who today do not even have that kind of career choice because of poor-quality education in their communities.

And that's our core education problem. Broken public-school systems constrain social mobility. Although college completion is the most effective social-mobility tool we have, only about 1 in 7 low-income students earn a degree. In other words, what we should really be concerned about is not being outcompeted by other countries but whether we'll start looking like too many of the ones that have static class structures and highly inequitable distributions of wealth. That prospect, much more than what kids in Shanghai or their moms are doing, should alarm us.

Andrew J. Rotherham, who writes the blog Eduwonk, *is a co-founder and partner at Bellwether Education, a nonprofit working to improve educational outcomes for low-income students. School of Thought, his education column for* TIME.com, *appears every Thursday.*

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THE NEW YORK TIMES

CHINA'S WINNING SCHOOLS?
1/15/2011

January 15, 2011

China's Winning Schools?

By NICHOLAS D. KRISTOF

BEIJING

An international study published last month looked at how students in 65 countries performed in math, science and reading. The winner was: Confucianism!

At the very top of the charts, in all three fields and by a wide margin, was Shanghai. Three of the next top four performers were also societies with a Confucian legacy of reverence for education: Hong Kong, Singapore and South Korea. The only non-Confucian country in the mix was Finland.

The United States? We came in 15th in reading, 23rd in science and 31st in math.

I've been visiting schools in China and Asia for more than 20 years (and we sent our own kids briefly to schools in Japan, which also bears a Confucian imprint), and I've spent much of that time either envious or dumbfounded. I'll never forget pulling our 2-year-old son out of his Tokyo nursery school so we could visit the States and being handed a form in which we had to list: "reason for proposed vacation."

Education thrives in China and the rest of Asia because it is a top priority — and we've plenty to learn from that.

Granted, Shanghai's rise to the top of the global charts is not representative of all China, for Shanghai has the country's best schools. Yet it's also true that China has made remarkable improvements in the once-awful schools in peasant areas.

Just 20 years ago, children often dropped out of elementary school in rural areas. Teachers sometimes could barely speak standard Mandarin, which, in theory, is the language of instruction.

These days, even in backward rural areas, most girls and boys alike attend high school. College isn't unusual. And the teachers are vastly improved. In my Chinese-American wife's ancestral village — a poor community in southern China — the peasant children are a grade

ahead in math compared with my children at an excellent public school in the New York area. That seems broadly true of math around the country.

For a socialist system that hesitates to fire people, China has also been surprisingly adept — more so than America — at dealing with ineffective teachers. Chinese principals can't easily dismiss teachers, but they can get extra training for less effective teachers, or if that doesn't work, push them into other jobs.

"Bad teachers can always be made gym teachers," a principal in the city of Xian explained to me as she showed me around her kindergarten. In China, school sports and gym just don't matter.

(That kindergarten exemplified another of China's strengths: excellent early childhood education, typically beginning at age 2. Indeed, the only element of China's education system that really falters badly is the university system. Colleges are third-rate and should be a national disgrace.)

But this is the paradox: Chinese themselves are far less impressed by their school system. Almost every time I try to interview a Chinese about the system here, I hear grousing rather than praise. Many Chinese complain scathingly that their system kills independent thought and creativity, and they envy the American system for nurturing self-reliance — and for trying to make learning exciting and not just a chore.

In Xian, I visited Gaoxin Yizhong, perhaps the city's best high school, and the students and teachers spoke wistfully of the American emphasis on clubs, arts and independent thought. "We need to encourage more creativity," explained Hua Guohong, a chemistry teacher. "We should learn from American schools."

One friend in Guangdong Province says he will send his children to the United States to study because the local schools are a "creativity-killer." Another sent his son to an international school to escape what he likens to "programs for trained seals." Private schools are sprouting everywhere, and many boast of a focus on creativity.

For my part, I think the self-criticisms are exactly right, but I also deeply admire the passion for education and the commitment to making the system better. And while William Butler Yeats was right that "education is not filling a bucket but lighting a fire," it's also true that it's easier to ignite a bonfire if there's fuel in the bucket.

The larger issue is that the greatest strength of the Chinese system is the Confucian reverence for education that is steeped into the culture. In Chinese schools, teachers are

much respected, and the most admired kid is often the brain rather than the jock or class clown.

Americans think of China's strategic challenge in terms of, say, the new Chinese stealth fighter aircraft. But the real challenge is the rise of China's education system and the passion for learning that underlies it. We're not going to become Confucians, but we can elevate education on our list of priorities without relinquishing creativity and independent thought.

That's what we did in 1957 after the Soviet Union launched Sputnik. These latest test results should be our 21st-century Sputnik.

I invite you to comment on this column on my blog, On the Ground. Please also join me on Facebook, watch my YouTube videos and follow me on Twitter.

THE ATLANTIC

THE EDUCATION SYSTEM THAT PULLED CHINA UP MAY NOW BE HOLDING IT BACK
12/7/2010

the Atlantic

The Education System That Pulled China Up May Now Be Holding It Back

By Helen Gao

China wants inventors and entrepreneurs, but its schools, built around the notorious gaokao *exam, are still designed to produce cookie-cutter engineers and accountants.*

A student, studying for the *gaokao*, naps on a desk during his lunch break in a classroom in Hefei. (Reuters)

On the morning of June 7 every year, Beijing's normally chaotic streets fall silent. Police patrol the main roads on motorcycles, as construction workers put down their hammers and power down their cranes, and rowdy taxi drivers finally take their hands off the horn. It is the first day of *gaokao*, the annual, nationwide college entrance exam, which will decide the college matriculation of the nine million or so students who take it. Sitting for nine hours over two days, students are tested on everything from Chinese and math to geography and government. The intense, memorization-heavy, and notoriously difficult *gaokao* can make the SAT look like a game of Scrabble. How they do on the test will play a big role in determining not just where they go to college but, because Chinese colleges often feed directly into certain industries and fields,

what they do for the rest of their life. It's an enormously important moment in any Chinese student's life, which is part of why high schools here dedicate months or even years to preparing for the test.

In many ways, the *gaokao* is symbolic of China's rise, with millions of Chinese striving and competing to pull up themselves and their nation. But it's also symptomatic of how far China still has to go, as the country tries to shift its economy from exports to domestic consumption, from assembling products to designing them. China's *gaokao*-style education system has been great at imparting math and engineering, as well as the rigorous work ethic that has been so integral to China's rise so far. But if the country wants to keep growing, its state economists know they need to encourage entrepreneurship and creativity, neither of which is tested for on this life-determining exam.

In 2010, an international standardized test found that junior high school students in Shanghai had outperformed their peers in rest of the world in math, science, and reading, beating the U.S. averages by a wide margin. Many in the West saw it as an alarming indication of their own decline, but in many ways it was a sign of the amazing growth of Chinese education over past three decades, rebuilt from shambles after the decade-long Cultural Revolution ended in 1976. So far, it has served China phenomenally: its nine-year compulsory education system, installed in 1986, has boosted the country's literacy rate to around 92 percent (it was 67 percent as of 1980) and prepared millions of eligible young people for the rapidly expanding workforce. Now, however, as the economy shows signs of cooling, Chinese leaders are trying to engender more domestic innovation.

They hope to see an educated workforce, rather than toiling on factory floors or sitting in the cubicles of Western companies' Chinese branches, found their own businesses or brands that will sell to domestic as well as international buyers. They want domestic moviegoers to stop purchasing bootleg DVDs of Western blockbusters, and for foreign viewers to start raving about Chinese films. But the nation's education system, instead of channeling the youthful energy of China's next generation, seems to be blocking it.

When I first came to the U.S. to start school here, after having just finished my junior year at a high school in my native Beijing, I quickly learned that the challenge I faced was more than just a language barrier. The analytical essays on my history tests felt dauntingly, even impossibly amorphous compared to the straightforward multiple-choice questions that had long characterized my exams. (The nature of China's New Democratic Revolution? Anti-imperialism, anti-feudalism, and anti-bureaucratic capitalism, in that order. The Nationalist Army's stance during the anti-Japanese war? Passively counteracting Japan and actively combating the Communist Party, as neatly summarized by the textbook.) I was used to strictly formatted Chinese argumentative essay topics, for which I had memorized hundreds of paragraphs that I could organize like jigsaw puzzles. Western-education-style papers on, for example, the significance of symbols in a novel was not the sort of expressive, creative thinking for which my Chinese teachers had prepared me.

Education experts in China have debated the perks and flaws of the country's rote teaching style for years, but most students, comfortably immersed in a system that rewards and reinforces their

ability to memorize and emulate instead of to analyze and question, might not as easily realize its limits from the inside. But some have rebelled, such as the well-known Han Han, China's most popular blogger. He sparked a small national controversy when, announcing that the Chinese education system left too little room for his more disruptive style of thinking, he dropped out of high school. In one essay, he mocked Chinese education, comparing it to "standing in the shower wearing a padded coat." In other words, he sees it as an exercise absurdly ill-suited to achieving its goals. "The problem with our education is that no one will go take a shower naked," he wrote, "but too many are taking the shower with a padded coat."

Students with ideas that deviate from the official orthodoxy often seem to struggle in China's education system, as do students whose pursuits differ from the system's rigidly defined standards for talent and success. Most students are required to take the same classes regardless of their talents or interests. Their achievement is measured solely by their scores in *gaokao*, and hobbies not convertible into *gaokao* points are deemed distractions. Why play soccer or take part in the student council, after all, if it leaves less time for cracking chemistry problems? You live and die by your numbers, starting with your *gaokao* score, a value system that is reinforced by employers and families alike. Many people in China know and even venerate the stories of Bill Gates and Steve Jobs dropping out of college to start their own businesses. But when I told Chinese friends that a college classmate was taking a gap year to do mountaineering, they responded with baffled looks.

Whatever your formula for innovation -- diversity of thought, collaboration, risk-taking -- you're not likely to find it in abundance in Chinese schools, where high-stake tests pit students against one other in a zero-sum competition that can feel a little more *Hunger Games* than think tank. "[When] you feel that the guy sitting beside you is your potential enemy who may rob you of a lifetime of happiness, altruism is not going to be your guide," *gaokao* veteran Eric Mu wrote in an essay on Danwei titled, "Confessions of a Chinese Graduate." If you find a question you can't answer you certainly don't ask a classmate for help, Mu explained, because "[to] offer your knowledge or even your questions for free is not only time consuming but an aid to your enemies." Students whose unsatisfactory test scores lower their class's average often become social outcasts, as do the students who make everyone else toss in their sleep by working just a little too hard. Teachers and headmasters, whose reputations and salaries are tied to their students' exam scores, have more of an interest in maintaining a good average than in, say, dedicating extra time to a struggling student.

China needs a generation of entrepreneurs to develop a more innovative economy, its national leaders know, but a recent report found that only 1.6 percent of Chinese college graduates started businesses last year, the same as the year before. Opening up local e-commerce stores or restaurants is great, but it's nothing yet on the scale of a Chinese Apple or a Chinese Facebook. The nation's high-profile entrepreneurs, such as Pan Shiyi and Zhang Lan, are worshipped by young, middle class Chinese. But these business megastars are largely perceived as distant celebrities, rather than as role models who should -- and can -- be emulated.

Chinese elementary school textbooks tell the stories of the "Four Great Chinese Inventions": the compass, gunpowder, papermaking, and printing. First coined by Francis Bacon out of admiration for how powerfully these inventions had reshaped the world, the term is promoted by

the today's leaders as evidence of the creative wisdom that runs through China. Chinese educators, eager to surface more young innovators like Cai Lun, who made the world's first sheet of paper, have decided to immortalize the great inventor in their own way, by embedding his name into a three-point multiple-choice question of the *gaokao* history exam.