Chinese Lessons

Shanghai's Rise to the Top of the PISA League Tables

Edited by Marc S. Tucker

教育

The Chinese characters on the cover translate to “Education.”

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Interviews with:
Kai-ming Cheng
Tom Corcoran
Ben Jensen
Vivien Stewart
Minxuan Zhang

Interviewed with an introduction by Marc Tucker

Center on International Education Benchmarking®
Learning from the World's High Performing Education Systems

A Program of the
National Center on Education and the Economy®

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Marc Tucker
Introduction

In 1978, when Deng Xiao Ping took the helm in China, the schools there were in disastrous shape. Mao had closed them years earlier, during the Cultural Revolution, and sent the teachers out to the countryside to perform manual labor, to do penance for their bourgeois values.

But, when the 2009 PISA results came out, Shanghai was at the top of the global education league tables. And, when the results for 2012 were released in December 2013, Shanghai still topped the charts, but its average performance had improved by more than four percentage points from the previous survey.

How could this have happened? Many of us had earlier been struck by the Singapore achievement. Singapore had gone from having hardly any public education system at all when it first became fully independent in 1965 to the top of the charts in the 2000 PISA survey. But Singapore had a population of only 2.5 million when it began and around 5 million when it won the PISA sweepstakes in 2000. It was only 31 years from the time Deng Xiao Ping took over the leadership of China in 1978 to the year in which Shanghai first topped the PISA league tables. And Shanghai was not a small island of two and half million souls, later to be five. By 2013, Shanghai had a population of more than 23 million people.

So, again, how could this have happened? I recently posed that question to five observers in telephone interviews. The people I talked with were:

Kai-ming Cheng Cheng is Chair Professor of Education at Hong Kong University where he previously served as Senior Advisor to the Vice-Chancellor. A former member of the faculty at the Harvard Graduate School of Education and advisor to the World Bank, the Asia Society and many other institutions with major roles in education worldwide, Cheng played a central role in the recent education reforms in Hong Kong and serves as an advisor to both the Shanghai Municipal Education Commission and the Chinese Ministry of Education.

Tom Corcoran Corcoran is co-director of the Consortium for Policy Research in Education at Teachers College, Columbia University. Over the years, Corcoran has

led a number of high profile research, evaluation, and professional development projects in the United States and abroad. A decade ago, Corcoran was working closely with the Shanghai Municipal Education Commission; that experience provided the opportunity to learn a lot about education in Shanghai before the more recent reforms were implemented.

Ben Jensen Jensen spent five years as a highly regarded analyst in the OECD Education Directorate before returning to Australia to lead the education work of the Grattan Institute in Melbourne. Two years ago, he completed a comparative study of the education systems of a number of East Asian education systems that was very well received by the government in his country. Currently he is conducting a study of the Shanghai system for the continuous professional development of teachers that has also gotten a lot of attention.

Vivien Stewart Stewart is semi-retired, and, in that capacity, Senior Advisor to the Asia Society for Education, where she was, until recently, the Vice President for Education. While at Asia Society, she was often in China, meeting with education officials at every level and visiting Chinese schools. Prior to joining Asia Society, Stewart directed the children, youth and education programs at Carnegie Corporation of New York. Though she professes to be retired, Stewart is in great demand all over the world at gatherings at which comparative national education performance is the key topic.

Minxuan Zhang Zhang is President of the Shanghai Normal University; Director of the Center for International Education Study and Consultation in the Chinese Ministry of Education and a scholar in the field of comparative education. He has served as the Director-General of the Shanghai Academy of Educational Sciences. From 2004 through 2011, Zhang was the Vice-Director General of the Shanghai Municipal Education Committee, and, in that capacity, in charge of planning many of the education reforms for which Shanghai has since become famous.

Three of these people—Kai-ming Cheng, Vivien Stewart and Minxuan Zhang—serve as members of the International Advisory Board of the Center on International Education Benchmarking, a program of the National Center on Education and the Economy.

What is striking about these interviews is the way they complement each other. Each of the interviewees sees Shanghai through a different lens. One gets a complete picture only by combining these different views.

Minxuan Zhang makes the key point that some of what Shanghai has accomplished is a function of characteristics of China and Shanghai that have been in place for a very long time and others are the result of specific policies enacted by the Shanghai Municipal Education Commission over the last three decades. He terms these the three "Traditions" and the six "Moderns." It is only by combining these two

influences that you can begin to understand what happened. He gives the reader an insider's view, indeed, a designer's view. And you can see how the pieces fit together in his mind, into one highly coherent whole.

Vivien Stewart's account of the chief characteristics of the Shanghai approach tracks Minxuan Zhang's very closely, though she brings a very different angle of vision to the task. This is not surprising, because Stewart has been visiting China regularly for two decades and has been a frequent observer of the Shanghai education system for more than a decade. Because she has seen a lot of China outside Shanghai, she is able to parse out what is common to Chinese education as a whole and what is unique to Shanghai.

Tom Corcoran was immersed in the Shanghai education development effort early on, mostly before the most recent policies were formulated and implemented. He left the scene just as Stewart began her visits to Shanghai. Because he spent a lot of time in Shanghai schools, Corcoran is able to give us a first-hand, detailed and nuanced view of what instruction looks like in Shanghai schools, and the ways in which the organization of Shanghai schools and the posture of the system toward teachers has contributed to professional teaching practice in that city.

Both Stewart and Corcoran point to Shanghai's approach to the continuing professional development of teachers, its unyielding focus on instruction, its interest in learning from others and its system for improving the performance of low-performing schools as areas in which other countries have a lot to learn from Shanghai.

Kai-ming Cheng and Ben Jensen would, I think, agree with that, but both caution the reader not to do what analysts so often do: focus on a few key facets of the system in a search for magic bullets, ignoring the fact that the success of these particular factors is made possible only by the myriad other features of the system that gives it its particular gestalt. We cannot, they say, really understand how the Shanghainese built such an effective education system unless we understand it as a system that is more than the sum of its parts. People educated in the analytical methods of the sciences typically analyze everything, decomposing systems into their constituent parts and try to estimate the contribution of each to the effect on student achievement. By all means, do that, say Cheng and Jensen, but, unless you grasp holistically the way the whole comes together, unless you grasp the motivating spirit of the system, you do not really understand anything very important.

That said, Jensen points out that Shanghai's unique system for the professional development of serving teachers relies not on workshops done by outsiders, although there are plenty of those, but rather on the way teachers' work is structured and the resulting incentives and support Shanghai teachers have for the continuous disciplined improvement of their teaching practice. Cheng attributes no small part of Shanghai's success to its unrelenting focus on learning, not learning as measured

by one or another particular test—though he, like Zhang, sees Shanghai's embrace of PISA as a major factor in its success—but learning as measured by the degree to which students are actually learning what the designers of the system had in mind for them to learn, always more than what any particular test can measure.

I will not summarize the interviews here. They do not need a summary. But there are several points I'd like to make about what we might learn from Shanghai.

The first has to do with certain elements in Chinese culture that contributed to the foundation on which the Shanghai Municipal Education Commission built its policies.

It is incontestable that the high value the Chinese place on education has been a powerful asset to modern China in building a first-class education system. Parents and their values and attitudes matter. What they communicate to their children about the importance of paying attention in school, doing what is asked of them by their teachers and achieving at the highest possible level are very important determinants of high achievement. These values are in large part the legacy of a system in which, for two millennia, the only hope of improving one's condition lay in passing the civil service exams. But that has proven to be a two-edged sword. As Minxuan Zhang points out, those exams, which exist to this day in the form of the Gaokao, the university entrance exams, provide the strongest possible incentive to students to work hard in school, an incentive that Zhang sees as an essential element in the Chinese system. At the same time, many people in China are upset about the success of Shanghai on the PISA league tables, because they think that success will blunt the edge of their fight to dethrone the Gaokao from its premier position as the sole determinant of advancement in Chinese society. They see the Gaokao as enforcing an outdated ideal of education, one that rewards memorization and rote learning over understanding and the ability to apply mastery of complex skills to real world problems, particularly problems requiring innovation and creativity. It is too simple to see culture as the source of China's success. The Chinese think that these ancient commitments are both the source of their achievements and, at the same time, a drag on their ability to make the kinds of changes they need to make to adapt to the demands of today and tomorrow. What is interesting here is that the Chinese are working hard to preserve the elements of their culture that they continue to value and just as hard to ditch the elements of their culture that they think are no longer useful.

The second point I'd like to make has to do with Shanghai and teacher quality. For much of the three decades during which they have been building their new education system, the Shanghai authorities simply did not have the luxury of recruiting their teachers from among their top high school graduates, or the luxury of requiring their teachers to have a masters degree in order to join the teaching force, two very important arrows in the quivers of the top performers which have come from the

ranks of the world's richest countries. So how have they managed to produce such capable students?

There seem to be two answers to that question. Though their teachers generally have only bachelor's degrees, Shanghai has insisted that that bachelor's degree be in the subject the teacher will teach, even for their primary school teachers. That means that their primary teachers of math and science will have bachelor's degrees in mathematics and science! Years ago, a book by Liping Ma documented in detail the superior understanding of elementary school mathematics on the part of Chinese teachers vis-a-vis American teachers. There is every reason to believe that the poor performance of American students in both mathematics and science is mainly due to the difference between Chinese teachers and American teachers in their understanding of elementary mathematics and beginning science. This insistence on mastery of subject matter for all teachers, no matter the grade level, could be one of the most important explainers of Shanghai's superior performance.

So, forced to make a choice about how best to use a four-year program of teacher education, the Chinese chose mastery of subject matter as their focus. The evidence is that the result was that their teachers appear to have ended up with a better mastery of the subjects they teach than ours, at least in the lower schools. But the story does not end there. The Chinese believe very strongly that it is very important that their teachers master the craft of teaching. Their way of acting on that belief was to develop an apprenticeship program for learning the craft of teaching, one of the strongest such programs in the world. That program has two key elements. The first is the construction of a very rigorous career ladder system for career teachers, with many steps in it before one gets to the top of the ladder. The second is the use of top teachers in that career ladder system as the masters of the apprentice teachers just beginning their careers as apprentices. In my opinion, this is a vastly superior system to one in which the instruction given to prospective teachers in the craft of teaching is given in classrooms in schools of education, when that instruction is offered by people who have not been in school classrooms themselves for years and may never have been master teachers.

Next is a point made by all the interviewees: One of the most important and unique features of the Shanghai system is the way it supports and incentivizes the continuous disciplined improvement of teacher performance. Shanghai appears to do this better than any other state, provincial or national education system. Read through these interviews and you will be able to develop a composite image of how this is done that is detailed and nuanced. You will find that, although Shanghai has its share of organized workshops for teachers, what is truly valuable in the Shanghai system for the continuing development of teachers competence has nothing to do with the workshop model of professional development so characteristic of Western approaches to this issue.

But this is precisely the sort of thing that Cheng and Jensen caution us about. If you just take away the strategy for continuing professional development of teachers, you are likely to miss its animating spirit, and, absent that animating spirit, you may find that your own implementation of the Shanghai design may be a disappointment. Underlying that design is a profound respect for teachers. The whole system reflects a commitment to true professional status for teachers, a desire to put teachers at the center of the improvement process. It begins with training teachers in research methods and organizing schools so that teachers, not administrators, can lead the process of improving the curriculum and teaching methods, working together, as a team. The whole system is built on a truly professional model of teaching and teachers.

I mentioned earlier that both Stewart and Corcoran call particular attention to the importance of Shanghai's strategies for improving the performance of its low-performing schools. It is worth mentioning that their system for improving the performance of their low-performing schools began as an effort to improve the performance of the schools that primarily serve the children of migrant workers. Who are these migrant workers and how are they related to Shanghai's strategy for improving the student achievment in their low-performing schools?

I began this introduction by asking a simple question: How did Shanghai do it? But there are those who are asking a different question: Whether Shanghai did in fact do it. They essentially argue that most of the children of Shanghai's migrant workers are not counted in the PISA statistics, giving a very skewed picture of the Shanghai accomplishment.

This is a very serious issue. It hinges on the Chinese system of Hukou, which is the set of policies under which every Chinese citizen is registered in a particular province and is not entitled to the services of any other province even if they are working there full time. Education is one of those services. Under that set of rules, the children of ordinary low-skill, poorly educated migrants who have come to work in Shanghai are not entitled to go to the Shanghai public schools.

The effect of the Hukou policy on the vast majority of the hundreds of millions of migrants who have played a key role in building modern China has been very unfair and often painful to relate. Tom Millers' *China's Urban Billion* provides a detailed and sometimes harrowing account. But as Miller points out, many leaders in China and in Shanghai in particular have been working to change the system, partly from moral conviction and partly because they understand that, while low cost, poorly educated labor may have lifted China up to its current position on the world stage, it will take far better educated workers to keep it there. So the Hukou rules have been changing and moderating. My own reading of the evidence suggests that many more of the migrant children are currently counted in the PISA results than some critics believe.

In his interview, Minxuan Zhang did not dismiss the Hukou problem as small or unimportant. He sees it as an issue of basic human rights. And he also recognizes that the migrants are not going home and therefore will, along with their children, constitute a very large share of Shanghai's future work force, thereby putting Shanghai's further development and political and social stability at risk if they are not educated to the same standard as those registered in Shanghai. By his account, if current policies are pursued, the migrant children are likely to be fully incorporated into the Shanghai public schools within ten years.

Shanghai did not became part of the PISA system in order to make a statement about where Shanghai might place on the PISA league tables. City officials decided to get involved in PISA because they saw PISA as a tool they could use to modernize their curriculum and pedagogy, to wean their teachers from a system too wedded to the accumulation and regurgitation of facts and the execution of rote procedures. They realized that they could use PISA's test items as a way to help Shanghai teachers understand what the Commission valued in a student's education and they could use the released items as a way to get those teachers involved in a conversation about what sort of pedagogy would best produce the kind of education they wanted for Shanghai students.

In a way, we can view Shanghai's embrace of PISA as one aspect of a very strong drive in China to make an opening to the rest of the world, what Minxuan Zhang calls the "open door" policy in his interview. Few aspects of Chinese policy are more important than this drive to learn as much as possible from the world's most developed countries.

Shanghai's open door policy stands in stark contrast to the stance the United States has taken. Too many Americans have reacted to the steadily declining standing of the United States on the PISA league tables either by challenging the methodology of PISA or finding a reason to invalidate the results by claiming that none of the countries higher in the league tables than the United States can be compared to the United States because of some factor that is alleged to make the United States unique among the family of nations.

History will not deal kindly with the United States if it fails to do what other countries have done when confronted by their poor performance on the PISA surveys. They have closely examined the PISA data for clues as to what they are doing wrong and what the top performers are doing right. When the United States chooses to do that, it would be well advised to look hard at Shanghai.

Vivien Stewart

Marc Tucker: When did you first go to China? And in what capacity?

Vivien Stewart: I first went to China in 1992 but have been visiting China regularly as an educator since 2002. I have taken more than eight delegations of American principals, state commissioners of education and federal officials to visit schools and ministries of education in different parts of Asia. And I have hosted Asian educators who came to the U.S. to learn about aspects of U.S. education. As part of this, I have been to Shanghai seven or eight times.

MT: Would you have thought back then they would have topped the league tables on PISA within a few years?

VS: I don't know that I would have predicted that in 2002. But it was clear that China was making enormous strides in education and was committed to constant improvement. In the immediate post-Mao period, of course, they were focused not on quality but on quantity – the rapid expansion of primary schools to the whole population, then gradually adding middle and upper secondary schools.

MT: Now, of course, Shanghai shines with respect to the quality of student achievement. Did you see anything during your successive trips to Shanghai over the years that prepared you for this?

VS: Let me describe a conversation I had with the Director General of the Shanghai Education Commission a couple of years ago. He said that whenever he talks to westerners, "they assume Shanghai's secret is 'Tiger Moms'. But, while many Shanghai families pressure their children to achieve at high levels, the reality is that I have both under-involved and over-involved parents and it is my job to serve the children of both." He said, "It is not something that happened overnight. It was a 30-year process of gradual improvement. In the 70s and 80s, the push was about expanding access to schools. In the 90s the focus shifted to improving the quality. A national curriculum reform effort was piloted in Shanghai, and later spread around the country, to broaden the curriculum beyond math and science to arts and literature and also to initiate change towards more active kinds of pedagogy. There

was also a major emphasis on upgrading the teaching force and trying to reduce examination pressure. In Shanghai, we abolished end of primary school exams, so schools could focus on deeper learning rather than teaching to the exams."

In the 1990s, in the big cities, there were "key" High Schools that had very high standards. At those schools, 15-year-old Chinese students could talk to you in English about the science experiments or extracurricular club they were engaged in or about American history or geography and current affairs. But there was a big gap between these key schools and other schools. So in Shanghai as well as in some other eastern cities, they decided they had to bring up the bottom schools, which included large numbers of poor students whose families had migrated to the cities from the countryside. Shanghai experimented with lots of ways to bring up the bottom: High-performing schools were expected to partner with struggling schools to bring up the quality of their leadership and teachers; some principals from high-performing schools were asked to manage more than one school; schools in certain areas were formed into clusters to share resources; and under the "empowered management" scheme, a high-performing school could be given a contract with funding attached to improve a lower-performing school. Principals and teachers would spend time in each other's schools, working on improving management and instruction.

Another effort to bring up the bottom involves how the teaching profession is structured: there are clear career ladders for teachers, and one of the expectations for teachers who wish to reach the top of 13 levels is that a teacher needs to have spent time teaching in a lower-income area. Teachers aren't assigned or required to teach in such schools, but they are strongly encouraged and there are career incentives to do so.

Then there is the system of professional development for teachers, which is similar to those in other East Asian systems. This professional development system is one important strategy for achieving high standards in individual schools and greater consistency across schools throughout the whole system. Mentor teachers run weekly meetings with teams of teachers from the same subject or grade level focused on some aspect of instruction that needs improvement. There is also a great deal of classroom observation that takes place. In Chinese classrooms, there always seem to be multiple adults in the classroom—teachers observing each other, student teachers observing master teachers, and groups of teachers from other schools circulating among classrooms. In this sense, teaching practice is very public. This puts a subtle pressure on teachers who perform less well to improve their skills and, at the same time, gives them an opportunity to see how other teachers get better results. As senior teachers move up the ladder they may also undertake action research projects. They select a particular educational issue and review the literature, test out different approaches in the school and report on the results. The researcher teachers— I recollect that there are about 900 in Shanghai—work together in groups and share results across schools and the district. These measures, together with others, constitute a system to

gradually ratchet up quality within and across schools. This is how disparity between schools is being reduced in Shanghai.

MT: If there are 900 research teachers in Shanghai, the structure of the career ladder must mean there are a small number at the top so it is an enormous honor.

VS: It is an enormous honor to become a master teacher and a major responsibility because these teachers work hard both in their own schools and in others. But beyond the master teachers, all teachers are seeking to progress up the career ladder, which means not just improving your own teaching but also participating in the professional development of other teachers and improving the overall instructional quality of the school. The tradeoff for this continuous professional development system is larger class sizes because teachers aren't in front of students as many hours a day as they are in the United States.

MT: Are there incentives for high-performing schools to work with low-performing schools?

VS: It is largely a social commitment to promote equity in the schools in the city. Certainly when you talk to principals of high-performing schools, that is the language they are using. It is an expectation that if you want to be seen as a good citizen and get the benefits of being a high-performing school in Shanghai, you need to do your part to help low-performing schools. It does bring extra work and there are some financial incentives. The Shanghai Education Commission gives out grants to the higher-performing schools to help turn low-performing schools around.

MT: You said that one of the tasks Shanghai set for itself was curriculum reform. What has been the nature of those reforms and how has PISA fit into those reforms?

VS: China was interested in PISA as part of its curriculum reform effort to try to move the system from its very traditional knowledge transmission style to one that promotes problem solving and critical thinking. They see PISA as part of this effort. If you look at a PISA question (past ones are available on OECD's website) and compare it with, say, a NAEP test or a traditional Chinese test, you can see that PISA questions are very different and do encourage problem-solving and application of knowledge. So Shanghai is using PISA questions not just as a test to give to a sample of students in an international comparison but with all their students. They are using it as part of their efforts to promote problem solving and you can see the results.

MT: How different is Shanghai from the rest of China when it comes to education policy and practice?

VS: On the one hand, Shanghai is very much a part of the Chinese system. Many aspects of educational practice are common across China. China is not nearly as

centralized a system as people think, but there are several things that are driven from the national level:

- Long-term planning for system design and improvement.
- A national curriculum framework that includes a strong core curriculum, especially in math and science. Teachers have strong subject matter preparation in math and science, even in elementary school, where there are specialized math and science teachers.
- Funding for demonstration programs that are initially piloted in places like Shanghai and then offered to other parts of the country.
- Funding to support expansion of secondary schools in poor areas and the development of a teaching force in rural areas.

On the other hand, Shanghai is clearly not representative of the whole of China. It is the leading province both economically and in terms of education. Many of the other eastern provinces are improving their education systems rapidly as well. But there are other provinces in the central and western parts of China that are much poorer. They are desperately short of teachers and not nearly as far along in the extension of upper secondary education. In fact, the big challenges facing China in education are:

- The lack of equity between the developed coastal cities and more rural and western areas. The national government in China is very focused on this now because it is a threat to stability and also to their sense of themselves as a society. They have put hundreds of millions of dollars towards recruiting, training and supporting teachers in rural areas. Rural schools have been consolidated to improve their quality and resources. And a vast system of satellite delivered courses has been created as well as professional development "sabbaticals" for teachers in rural areas. But the gap remains large.
- The university examination system, the "gaokao," is governed by universities and is a very traditional examination. The pressure to get into universities, and especially the top universities, means that it has a huge impact on high schools and cuts against the efforts in Shanghai and other provinces to modernize the curriculum. The exam represents a huge weight on the system and on students. Shanghai is experimenting with alternatives for university entrance but there is great reluctance to change the university entrance examination because it is seen a guarantor of meritocracy.
- The capacity building that will be necessary to shift from the traditional Chinese teacher-dominated didactic classroom to a more modern model is another huge challenge.

The fact that Shanghai is a high-performing system doesn't mean that the United States should emulate all of its practices. There are many things about the Chinese education system that would not be at all attractive in the U.S.: The pedagogy is still

more traditional despite the recent efforts to change it; the single university entrance examination funnel creates tremendous pressure on students, and there is less choice in the curriculum to accommodate the interests of individual students. But there are other aspects that are worthy of serious attention. The way in which the professional development system creates ways to continually ratchet up school quality and promote more consistent performance across schools is something that a number of U.S. cities that participate in Asia Society's Global Cities Education Network are interested in. And Shanghai's efforts to bring up the performance of schools at the bottom are also worthy of attention.

And the U.S. has no choice but to pay attention. With this enormous education system graduating so many students who are far ahead of American students in reading, math, and science, there are obvious challenges to American competiveness.

Minxuan Zhang

The question on the table is why Shanghai has done so well on PISA. My answer will mainly cover what has happened over the last 30 years. Shanghai, of course, is part of China, a city of about 23 million people with the status of a province. It is one of a number of coastal provinces where industrialization got an early start that are doing very well. We should keep in mind that it is almost entirely urbanized now, and does not suffer from the problems of rural poverty that can be found in many places in China.

We should also bear in mind the fact that PISA only measures achievement in reading, mathematics and science. As a scholar, I share the widespread conviction that these subjects are very important components of basic education. But basic education should mean much more than that. We cannot say that just because we were successful in reading, math and science that the entire basic education system is successful.

And basic education is only a part of education. We cannot say that if basic education has succeeded, then the whole system has succeeded. Education is not only about basic education but also higher education, lifelong learning, vocational education, and so on. I don't think our higher education system is very strong. We still have a lot of things to do. We need to make progress not only in basic education, but in also the other parts of the education system.

PISA is not a game. It is not a competition for gold medals. It is a test, used for policy making and for policy improvement. So I don't think who was ranked first or who was ranked second is very important. The most exciting part of PISA is that almost all countries and regions can learn something from the PISA results. We in Shanghai think PISA is a very powerful tool that we can use to identify our own blind spots, our shortcomings and our problems and to improve our policies. In fact, we started a new round of education reform and development based on our analysis of our first PISA results. That is very important.

We also have to remember that each jurisdiction in the PISA survey is very different from the others. We cannot simply and directly transfer policies and practices from

one to another and expect to get the same results. Shanghai is very different from the United States. We cannot even compare ourselves directly with Singapore because we are so different. Most other participants in PISA are whole countries, but we are only a city. And it is a part, a very advanced part, of China. If we could see the whole of China on PISA, we would see big disparities. There are still many parts of China which are not as developed as Shanghai. We must do a lot of work to improve the education system for the country as a whole.

So it is important to recognize that Shanghai is not all of China and reading, mathematics and science are not all of the curriculum and the basic schools are not all of education. We need to be modest.

Now maybe I can come to what you are interested in.

Tom Friedman, the author of *The World is Flat*, came to Shanghai and spoke with me recently. Shortly afterwards, he did a column on education in Shanghai for the *New York Times* titled "Shanghai's Secret." And in his column he said there is no secret. He said instead that Shanghai simply does a very good job of executing the basics, doing what a competent education system ought to do.

Let me share with you here what I take those basics to be. First, I think of the three traditional culture elements. These have come down to us through the generations, over centuries. And then there are six modern innovations. You can think of these as the three traditions and the six moderns. When I talk with my Shanghai colleagues, we almost all believe that the three plus six are the most important elements of our system.

The first of the three traditional cultural elements is that the Chinese people have very high expectations in education. This is very important. The Chinese people, no matter what kind of family they come from—from the royal family (though now we have no royal family) to the peasants, from the professors to the workers—all families treat their children very seriously, with very high expectations and enthusiasm for education.

We have a lot of stories and legends about this. For example, when we tell our children stories about education, we always talk about Confucius. Besides Confucius we have another sage called Mencius. Mencius' mother moved three times in order to get a good education for her child, Mencius. We have a lot of similar stories about how the families should try to move their homes to give their children a good education, or ask their children to study very seriously, because they have high expectations and high hopes for them. And in China, all the Chinese people know that if you study hard you will become somebody, or you will get glory for your family. We have a lot of those kinds of stories. So this is the first important point: We have very high expectations for our children's level of education achievement.

The second is that the Chinese people believe that diligence, persistence and hard work will change your future—individually or for the family or for the whole nation. We really believe that. This is why most Chinese students are very, very diligent and work so hard in school. For example, there is a very old and popular story that says that a man wanted to study, but they had no light in the evening because they were very, very poor. So the man made a hole in the wall of his family's house so the light from the neighbors' house would come into his home. And then he used that very, very small light to keep reading. Another legend is that there was a person who studied very hard, but sometimes he would start to daydream. So he put some tacks on his chair to make it very difficult to let himself daydream while he did his reading. We have a lot of those kinds of stories.

The Chinese people do not say or believe that some people can learn and others cannot. Some are very, very clever and some are not so clever, but Chinese people believe that almost all can learn. Everybody has his or her own advantages. But no matter who you are, if you study very hard, you will be successful and you can change your future. In China we have the following saying: In the morning you may work the fields as a farmer, but if you are successful you can become the son-in-law of the royal family. But you can change your future only if you study very hard. Another saying we have is: In the books you will have your future, in the books you will have better income. Those kinds of idioms are very, very old, coming down thousands of years in our culture. So this is the second point: High expectations will not alone do the trick, one must also believe in the importance of diligence, for diligence is also needed to change your future.

When I talk to foreigners, I find that most nations have similar traditions. But why do the ordinary people in these other countries not believe as we do? I think the third cultural element is the most important. If the first two I mentioned are real culture, then the third is a mechanism of the culture. That is the public examination system. We have almost two thousand years of public examinations in our history, and now we still have various kinds of exams. The people believe that if you study very hard, then you can pass the examinations, and after you pass the examinations you will realize your future—your future will be bright. So all families, no matter rich or poor, are the same. You must first try to pass the examinations and then you can have the future you want. I think in the western countries they always say people are created equal or that before the law all people are equal. But this is not always believed by the people of those countries. However, in China it is believed: Before the examinations, all people are equal. If you pass the examination you will be successful. If you cannot, then people will ask, "Did you work hard enough? Did you study very cleverly? Are your approaches to studying effective?"

So the third is a mechanism. It comes down to us from more than 1300 years, even more than 2000 years. I have been told that before 124 BC China had already tried to establish the public examination system, and by about 1300 years ago the system was well established. And going down from that time to the present, every dynasty

used the public examination system. That mechanism allows the two traditions to continue. The people believe that no matter what happened, with the examination there, if you worked very hard, you could become the son-in-law of the royal family, or a high ranking official. In China we have the saying: Don't mention what kind of family the hero comes from. That means nothing. Maybe the hero comes from a very poor background. If he is successful, it must be because he really studied very hard.

Even now, if you want to be a PhD or bachelors or masters degree student, or if you want to be any kind of official, you have to pass examinations. Even highly ranked officials will be tested before they can advance in rank. I still remember that, just a few years ago, although the council had already selected me to be the Vice-Director General of the Shanghai Education Commission, I still had to pass an examination. I passed three tests: one was written, the second was on the computer and the third was an interview.

The examination may not be the best approach, but it keeps things equal. It keeps things fair, and it also ensures that no one can progress in the public service arena or in professional areas based on their family background. So in this way the people have their hope, and their high expectations can continue. If we didn't have the examination system, then the high expectations people have for their children would decrease, because the people would no longer believe that effort in schools would be rewarded. Maybe other countries do not have a system like this that gives everyone a fair chance, a system in which education is the great equalizer.

So these three traditions are very important.

Sometimes we consider that this kind of tradition is too strong, because it makes the students work very hard and lays a very heavy burden on them. And we are trying to reduce the pressure of the public examination and the high expectations on every child. We know that people are different and we certainly cannot say that only those who pass the examination can be useful. So we are trying to change, to reduce the pressure of the traditions. But few believe that the traditions are a problem, that they need to be abandoned. There is very strong support for them. They are important explainers of our success.

So maybe now we can come to the six modern innovations. The first of the six modern devices is the Open Door Policy. The Open Door Policy is the first important innovation in the last 30 years, because after the Cultural Revolution we realized that we had gone backwards compared to the rest of the world. So we were very, very eager to get the latest knowledge about successful experiences and modern approaches to reform our education system, from all over the world. We sent people to countries everywhere to learn from them. We studied their systems. We tried to attract scholars and professors from abroad to come to study or come to work in China.

Once I was asked by some colleagues from the U.S. Department of Education, "Would you please give me two or three examples of the Open Door Policy?" I said, "Oh, that's easy." For example, now, the United States I believe is the largest country in the world whose population speaks English, I mean mother tongue English. But I believe that China is the largest country that *learns* English. And this country is much larger than the largest country that speaks English. So you can see what kind of impact our Open Door Policy has had. Even beyond that, look at how many teachers we have cultivated, how much time we spend on them, and how many resources we spend on them. I think that if it were a business, it would be a very, very big business. So the Chinese people focus very much on foreign language studies. Why? Because we want to learn from the world and other countries. Our Open Door Policy is a sign of our willingness, our determination to learn from others, our open-mindedness.

Here's another example. I asked these foreigners, "Do you know of some modern well-known Chinese educator or scholar or education theory?" They said they didn't. So I said, "At least you know in China we have Confucius?" They said, "Of course, we know that." But I said that in China, we know of many scholars who are working in the education field right now in America, in the U.K., in Japan, in Australia, everywhere! No matter what kind of people they are or from what kind of countries, if their theories or approaches or experiences could be useful or interesting for Chinese people, then we will try to introduce them and their ideas to China.

In my university we have a publication called "Primary and Secondary Schools Abroad". Every issue of this publication sells out, at more than 8,000 copies. This is an indication of the demand in our primary and secondary schools for information about education in other countries. These days I've found that in China, where we have a lot of training courses for in-service teachers, very few trainers will give training courses without mentioning the work of foreign scholars. During a typical half-day in-service training course for teachers, there will almost always be at least some mention of the latest theories or practices from other countries. This is true even for teachers who teach the history of Chinese education! So the Open Door Policy is very, very important.

The PISA results show that students in Shanghai are not only learning by recitation or by rote-learning from memory. This is a big change. How did it happen? In the old days, Chinese people always said "If you can recite 300 poems from the T'ang Dynasty, then you become the poet." That means if you recite something, you have a very good memory and you can succeed. But the PISA results tell us that this is changing. More and more teachers know they need to use classroom strategies other than recitation and rote learning. We have other useful strategies to help the students. And we are even letting the students share their own successful approaches to learning. The Open Door Policy is very important because it not only introduced a lot of new policy options, but also important new practices that have had a big influence on everyday teaching and learning. This is the first modern innovation.

And the second is the Curriculum and Teaching Approaches Reform. From 1986 to the present we have done three rounds of Curriculum and Teaching Approaches Reform. Before 1986, all of China had only one unified set of textbooks and one curriculum. It was very, very centralized. But we learned something from the rest of the world. China is a big country, with many cultures and many stages of industrial development. So in 1986 we were allowed the right to develop the Shanghai curriculum, as long as it was consistent with the country's overall guidelines. Shanghai was the first to have its own curriculum, but, after Shanghai, many provinces were allowed to have their own curriculum. Of course there are still guidelines, but we can customize the curriculum at the provincial level, and some elements of the curriculum are even more localized.

In 1997, after 11 years, Shanghai initiated the second round of Curriculum and Teaching Approaches Reform. In the secondary round, we not only localized but we tried to consider the individual. We divided the curriculum into three parts. One is the core curriculum, which is almost 60 to 70 percent of the whole curriculum. All the students learn this part. The second is the expanded curriculum. We believe that students are different. Some are good in math, others in science, and still others in the arts. So, building on top of the required basic curriculum, a student can expand in areas of that student's choice. The third part is what we call the "research curriculum". In fact, it consists of authentic projects, of the sort that one would do in a real job. So besides the daily curriculum and daily homework, we let the students have some long-term homework in the form of projects. Some might involve work in teams. You might be making something. You can do a research project in a particular area, maybe having to do with films, for example, or related to some social phenomenon. You might choose to make an airplane model, or a robot, or something like that. As you might expect, teaching approaches vary a lot among these three parts of the curriculum. There is rote learning, but there is a lot that is not rote learning. Many more modern approaches to instruction came to the fore during this second round of curriculum reform.

The third round of curriculum reform began just three years ago and is still going on. In this round we started shifting the focus from just knowledge to skills as well, and, in particular, the skills related to creativity and innovation. We are trying to improve the skills needed to work in laboratories, or in ICT areas, or other areas where there is a premium on creativity and innovation. It is not yet clear how best to cultivate the innovative spirit and capacity, but we are working hard to find out.

The third modern innovation may be the most important. That is teacher professional development. I found that, when we compared our own teaching staff to that of some states in the United States, we do not have as many with advanced degrees. As recently as 15 years ago, in Shanghai, a young person could become a primary school teacher with only a high school education, or, in some cases, two years of higher education. That is still true in some parts of China. But, over the last 20 years, Shanghai has paid a lot of attention to the initial education and training

of teachers, because we believe that teachers' development is the most important factor for the students. Our standards for joining the teaching force now are much higher than they were 15 years ago. Now, anyone who wants to be a primary or secondary school teacher must at least have a bachelor's degree and pass the licensure examination. So, on one hand, they have the content they need to teach, and on the other the ability to teach it.

The difference between China and the United States is that our teachers are subject teachers. Whether primary or secondary, all teachers must have a major subject or discipline. So if you want to be a teacher in math, you must graduate from the mathematics department of the university. If you want to be a science teacher, you have to graduate from the physics department or chemistry department or biology department or the science department. I think this is a good thing in Shanghai. All the teachers are very strong in the subjects they will teach. This is on one hand. On the other hand, they must be trained as a teacher. So when they are at the universities or after their graduation from the university they have to have their teacher training courses. Only after passing the examination, like every other profession in China, can one become a teacher.

But there are other countries that have developed similar policies for the development of new teachers. Our advantage, I believe, with respect to the quality of our teachers, lies in the way we continue to develop our teachers once they join the teaching force. We have at least six in-service training strategies. The most important is the one involving our "teaching and research groups" and the "grade groups". "Teaching and research groups" are not something rare or special. They are the way we organize the teachers in all our schools every day. "Teaching and research groups" include all the teachers who teach same subject. They come together once every week. In these groups they will discuss the things that are happening in their teaching, how they are teaching when they get success with students who have different needs, and what kinds of standards for the professional work of teachers seem to work best. The teachers from the same subject courses come together to share their experiences because they understand what matters are the important matters in their subject and what the most difficult points are. So they will discuss among themselves how to overcome those sorts of challenges. It is only once a week, but if you do it every week in the whole year, you will meet at least 40 times. And in 40—or even 10—years that is a very large amount of time. And in this way teachers can share their tacit knowledge about how to teach. I once did some research on tacit knowledge, and I concluded that this development and sharing of effective practices is among the most important things these professionals can do to improve their practice. The emphasis here, to be clear, is on the "how," not the "what" of teachers' practice.

And then we also have the "grade groups". In these groups, no matter what courses you teach, if you are teaching the same grade you work together once every week. The benefit of this group is that the students, who are almost the same age and in the same grade, often share the same activities and face similar problems. So different

teachers can have similar experiences with their students. The teachers in the research groups share the knowledge for the subject teaching, and then here they share the knowledge and the skills to deal with the specific grade of students. In some cases these groups are school based and in some cases they are university based. Of course, we have many in-service training mechanisms besides that. We have, I believe, six very important devices for in-service training, all of which, taken together, make for a very professional teaching force. Over the course of their career, our teachers find themselves constantly sharing their knowledge and skills with other teachers and learning from them at the same time. In this way, they do something that is a very important feature of the high status professions: they are constantly improving their mastery in a very disciplined way.

The fourth modern innovation is the work we do to improve low-performing schools. This too, I think, is a very important difference between China and other countries. We always try to pay attention to the lower-performing schools. For example, we use an approach called "Empowered Management." That means we empower a high-performing public school or an NGO to manage some low-performing schools. Just like Philadelphia in the 1990s, when you tried to use business companies to improve the low-performing schools. But we did not use business companies, because, in my mind, they are always trying to make money. Perhaps if the problem is efficiency, businesses can help. But if they really have educational problems, we not only need to find efficient strategies but also effective educational strategies. So the government empowered some local schools, some school principals and some professional NGOs to manage low-performing schools. And we have developed many other strategies over the last 30 years, such as trying to improve the morale of the low-performing teachers, trying to draw support from families and parents from the low-performing schools, trying to improve teaching and learning approaches of the teachers and students in lower-performing schools and trying to improve the self-confidence of the students in the lower-performing schools.

In some countries I think we pay too much attention to the better areas and the better schools. But that kind of strategy will not stimulate the improvement of lower-performing schools. However, if the poor schools are improved, then I think the better schools will be even better. So we use the Chinese idiom, "If the water in the river is getting higher, then the boat will be even higher." That means if the lower-performing schools are getting better, then the good schools will be even better. So we've paid a lot of attention to the poor schools, tried many approaches and strategies and tackled the poor performance. This is the fourth modern innovation.

The fifth is giving a part of the local educational levy from the rich districts to the poor districts. Education is always very expensive. We have an educational levy to help pay for it. Usually the levy is spent in the local community where it is raised. But we encourage the rich areas to move some funding to the poor communities. The government also uses other tax income to help the poor areas. In this way both the poor areas and the rich areas get better schools. If the poor areas do not have

some good schools and very good students, the good teachers will leave, and the schools there will be even poorer. Therefore, we pay a lot of attention to funding equity, not only in Shanghai but also for the whole nation.

The last modern innovation is that we reserve some quota of places in good schools for students from the low performance schools. These quotas allow low-performing schools to send their children, after graduation, to the best senior secondary schools, colleges and universities. We believe that if the students are very good in the low-performing schools, then maybe they are very clever and very diligent. So if you reserve some spaces in the universities and colleges and in the best secondary schools—from middle schools to high schools—for the best students in the low-performing feeder schools, then this will also improve the morale of the teachers and the school principals and the morale of the children and even parents in the low-performing schools.

So these are the six modern strategies. The Open Door Policy, the Curriculum and Teaching Approaches Reforms, the teachers' in-service training, tackling the low-performing schools, transferring of some part of the funding from the rich to the poor, and reserving spaces for the lower-performing schools to let their students into the best high schools and colleges—because of these experiences the Shanghai education in the last 30 years got each year a little bit better than before. But we still have a lot to do.

There is one more thing I should mention: our migrant workers. Migrant workers are a new phenomenon. Migrant families in Shanghai are families who move from a rural area to Shanghai to take advantage of the jobs available here. We have changed our policies concerning migrant children in recent years. In the old days, about 10 years ago, we only allowed students whose household is registered in Shanghai to attend Shanghai public schools. This household registration system is called the *hukou* system. Most of the workers who came from the countryside to work in Shanghai could not get registered in Shanghai. This has now changed. I believe it was around the year of 2008 that we opened the doors of our schools to the migrants. We call this the "two mainly" policy, and it means that the migrant children should be cared for mainly by the regions to which the children migrate, and migrant children should be offered compulsory education mainly in public schools. Yet, in the year 2009, when we joined the PISA, there were not so many migrant kids in the schools, but we are getting more and more. Last year, in 2012, in the primary school grade one, the migrant kids just barely outnumbered the local kids with household registration in Shanghai. This trend will continue. The government is now working hard to give equal opportunity to the migrant and peasant families' children.

We cannot say much about migrant students in PISA 2009, because in 2009, although the kids did very well, the number of the students who came from migrant families was still very low. But, from the year 2008, we had more and more migrant students in the Shanghai schools. That is when we began the new movement we

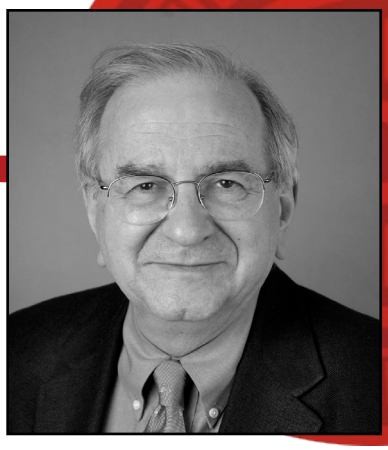
called “Education for All.” “Education for All” does not mean education for all the children with the Shanghai household registration, but education for all the kids in Shanghai.

Shanghai pays a lot of attention to the migrant students because we believe we have a responsibility to educate them well. It is a matter of human rights. If they come to Shanghai they should have just as good an education as the local people. But it is also true that if we do not give them a good education, the whole society may be less secure.

We can perhaps see the future in other cities with large populations of migrants and poor people that are not dealing with this issue very well. When I was in the government during the years 2004 to 2011, I focused on this issue as I took charge of the education strategic plan. Before that, I had visited Mexico and Paris and saw some of the problems there. So I said we should give migrant children the same education as those with household registration. At that time migrant children in Shanghai attended special immigrant schools. We tried to close all those schools down or to raise their quality. We worked to let the students into our own public schools. I believe that Shanghai schools will offer higher quality education. Assuming that the measures we have taken are continued, I think after ten years this will not be a serious problem, but I don’t want to make the prediction too early.

I’m not in the government now, but I have an obligation to keep talking about this, to remind our government about its importance, and try to make more effective initiatives for the children. This is my responsibility as an educator. The Chinese and the Shanghai people really believe that, because we know that all families, even the migrant families, still have very high expectations for their children. It is our obligation to make sure that the schools can help those children reach those expectations. We have sometimes seen the kids from the poor families work even harder than those from the rich families. They can do it if we give them a chance, and they will realize their dreams if we offer them better education.

Tom Corcoran



Marc Tucker: Tom, I know that it has been more than ten years since you were doing research in Shanghai, but I'd appreciate it if you would try to recall what you saw so long ago that made you think that, if the Shanghai students were ever assessed on a common assessment alongside the leading Western countries, they would do very well.

Tom Corcoran: The culture in China, and especially in Shanghai emphasizes learning and a strong work ethic; these historic values underlie the modern society that is emerging. These values are the foundation of Shanghai's education success. Students work hard during school, and often after school. Then you have the one child policy, which focuses parents' attention on the development of their one child in a way that profoundly impacts the child, family life and the interactions between families and children. People have been investing everything in their only child. There is much more intense focus in China than elsewhere on giving that child all the possible opportunities for growth that the family can provide.

Second, I would point to some features of the Shanghai system that collectively create a unique professional environment for the Shanghai teacher. Some of these features are widespread in China. Others are unique to Shanghai. The first is the apprenticeship model for inducting new teachers into the profession, in which new teachers are routinely apprenticed to master teachers in their schools. It is an honor to be recognized as a master teacher and they take their responsibilities for mentoring quite seriously. Second is the way teachers work together to develop lessons and, crucially important, questions to ask students during lessons that are designed to check for understanding. These questions are continually refined and tested and refined again by the teachers, working together. This has become a very advanced form of formative evaluation that plays a crucial role in helping teachers monitor student understanding and adjust their teaching in the light of the responses they receive to these probing questions, moment by moment. And that is not all. New teachers are observed frequently, and receive a lot of feedback and help on lesson plans.

And then there is the style of teaching: I was sitting in a Shanghai science classroom once with Milbery Mclaughlin, Carlo Parravano, and a bilingual Chinese supervisor. Forty students were sitting in rows in a theater style classroom as a teacher took them through the analysis of a problem he had posed. They were designing an investigation and the teacher was questioning them about what steps they would take. Milbery leaned over and said she would have to rethink what constructivist teaching looked like. Most people think it means activities in the classroom, hands on science. But here they were sitting in rows and the teacher was merely asking questions. What Milbery meant was the kids weren't conducting an investigation in a lab. They were not even active in the American sense of that word, but they were deeply engaged intellectually, thinking hard with the teacher about how to conduct an investigation of the problem. "This is minds-on, not hands-on," she said.

This approach is common in Shanghai but doesn't happen as much in the U.S. The teacher had really honed the questions and knew what he was asking and why and spent the whole period on designing this investigation. You see some version of this approach in many classrooms in Shanghai and across subjects. They do have actual labs, of course, but they also are asked to engage in a more purely intellectual activity, around what the question is and how we can answer it.

MT: If teaching is a collective effort, what role do other teachers play in conceiving of such lessons?

TC: When a new teacher arrives, the others already have well-designed lessons that they have been using successfully in the past. They share them with new teachers. They give new teachers feedback. There is, in particular, a lot of attention paid to helping the newcomer ask very good questions of his or her students. This is intended to do what in the United States is called formative assessment. The new teacher is taught to ask the kind of questions that will enable him or her to know hour-by-hour and minute-by-minute whether the students understand the material being taught, in real time. By focusing on how the new teacher would try to figure out whether the students understand the material, the more experienced teacher is able to foster a conversation about what is most important about the material being taught, how one would teach it, what kind of student work would show that the student was mastering it, what kinds of answers to the questions asked by the teacher would show the students really understood the material and what kinds of misunderstandings were keeping students from fully understanding the material. This is, of course, the essence of continuous assessment and instruction. So the Shanghai method of monitoring understanding by focusing on asking good questions gets to the very essence of great professional development.

New teachers are taught by the more experienced teachers how to do this. One of the chief inspectors of the Shanghai inspectorate said to me once that a good American teacher is like a jazz musician, listening carefully, trying to pick up the theme in the class and then responding. A good Chinese teacher is like a member of

the symphony, they know the piece very well and they do it just right. Whether this rehearsed piece works better than responding intuitively is not clear. In the Chinese exchange, the questions are coming from the teacher. In a good American classroom they also come from the students and sometimes from one student to another. We should dig into this as a research problem. I do know they work hard on the questions and fix them when they don't work.

It is also important to note that Shanghai teachers are in contact with classrooms of students for only about half of the school day, so they have a lot of time to talk to each other about what worked and what didn't and to get advice from each other about doing things differently.

MT: What is the probability that, if you walk into a Chinese classroom, you'll see another teacher there?

TC: You may see a teacher higher up on the career ladder and maybe an inspector. When I was there, teachers were being observed 20 to 30 times per year to give them feedback on their practice. When the inspector was there, he or she didn't have an observation form. They didn't think they needed one because they thought they understood what good instruction looked like. Younger teachers also were observed frequently by lead teachers in that subject in the school, and perhaps four to six times a year by an inspector. I noticed that when I was in Chinese schools, I typically observed teams of teachers talking with one another about the lessons and the questions they were using to find out what the students were learning. My experience is that American teachers, when they meet in the teacher's lounge, will talk about individual students, but not as much about instruction.

Kai-ming Cheng and Ben Jensen

Marc Tucker: The PISA data once again places Shanghai at the top of the league tables. Why has Shanghai been able to enjoy such success on PISA assessments?

Kai-ming Cheng: There are two different ways to look at this. First, there is the analytical view, carefully analyzing the data to try to tease out each of the major factors contributing to Shanghai's success and trying to partial out how much each individual factor has contributed to the overall result. This very useful approach is often seen as the most scientific. It is perhaps what Western medical science is doing—analyzing the whole thing into bits and pieces and trying to figure out how the combination of them comes together to produce what the economists think of as a production function.

But there is another way of looking at things. The individual factors are still there, but we begin by recognizing that, in the right circumstances, they produce outcomes that are more than the sum of the parts. This is the traditional Chinese way of looking at things in the field of medicine. The Chinese try to see the body as a whole system and try to understand how the system balances itself, in a holistic approach.

When we ask ourselves what has enabled Shanghai to get to the top of the league tables, and why the United States is so far behind, we could focus on such things as the Shanghai curriculum and the way Shanghai teachers work with the students in the classroom. We could ask about the nature of the recent reforms. We could look at the nature of the assessments and the way assessment results are used. We could go deeper, to try to understand how teachers think and how students work. But if we really wanted to understand what makes Shanghai tick, we will immediately touch on things that go beyond the individual components of the system. We might look into a typical day in the life of a Shanghai teacher or ask what the typical Shanghai student thinks about schooling and the way schooling does or does not fit into that student's fears and dreams. We might ask that student to reflect on the curriculum, on tests or on the way teaching is done in the school. Only after we had looked at schools from these and many other perspectives could we hope to put it all together into a reasonably accurate picture of schooling in Shanghai. If we really want to learn from the PISA results, we need both of these approaches.

To really understand why Shanghai students do so well on PISA, we need to understand that not all the answers will be found in the schools or even in the education system. When a student is sitting in the classroom and taking the PISA test, what goes on in his or her mind? Chinese parents' determination that their children will do well in school—though seldom as fierce as the "tiger mom" stereotype—and nationwide examination fever certainly explain some of it, but not the whole thing.

We also need to understand what has happened that has helped Chinese move away from the old ways of cramming and rote memorization. And finally what has been done in the recent years—the actual measures that Shanghai has taken with respect to such things as teacher development, pedagogy and assessment. And then we come to other elements, not specifically part of the primary and secondary school system, such as the university entrance exams, and the social role that they play. There is no simple, straightforward way to identify the elements that have accounted for Shanghai's success on PISA.

Ben Jensen: It is certainly true that Western academics try to identify discrete policies and practices, measure their independent effects and then assert that one or another of them is the answer. But anyone who actually works in any sort of large system or organization realizes that it is much more complicated than that. I've seen a lot of systems—and Australia is very good at this—that think one or two particular programs constitute our silver bullet. Whereas when you look at Shanghai, you see there is a very comprehensive, coherent long-term strategy embracing many elements, all of it clearly focused on teaching and learning. Kai-ming mentioned curriculum, assessments and teacher development, but there are also the Western systems' favorites of accountability and evaluation. But—and this is the important point—they look quite different because they focus on learning and teaching. I was in Shanghai recently and I heard yet again a real focus on children's learning habits, on what needs to be done every day inside and outside of school to encourage student learning. You would very rarely hear that discussed in a Western culture outside of a broader discussion about discipline. I think that reflects a strategy that really recognizes that in order to improve learning, you have to focus on behavior and culture and doing that requires a comprehensive strategy from beginning to end. It is that tendency to think about the whole system, the way all the parts and pieces fit together, while keeping the core gestalt in mind, that leads to the design of systems in which the whole is more than the sum of the parts. That's rare and it is a huge factor in Shanghai's success.

This characteristic—comprehensive systems that are coherent and focused on the things that matter most—is common to all the top-performing education systems, though Shanghai is better at it than most. One arena, however, in which Shanghai appears to be in a class by itself is the arena of continuing professional development for teachers. It's the best professional learning I've ever seen. We know the Shanghai teachers have very ample requirements for formal professional development but it's

the emphasis on mentoring and the form of collaboration among teachers who work together to continually improve learning in classrooms that is the heart of the matter.

Shanghai's system of continuing professional development is just one aspect of a system in which the improvement process is led by classroom teachers, treated as true professionals. Shanghai is the leading system in the world in terms of teacher-led research. Teachers are taught research methods during their professional preparation and are expected to use those research methods as they work in groups to systematically improve their teaching practices. Here again, the Shanghai expectation that teachers will be engaged in continual observation and feedback—whether it is part of the initial mentoring young teachers or it is for older or more experienced teachers through their group work and a general collaborative environment—is a key factor in creating an organizational environment in which teachers are continuously improving their professional practice.

There is evaluation of teachers, but it is not based on value-added methods of analyzing student performance on standardized tests. Rather, teachers are evaluated in part on their contributions to the development of their student's effective learning habits and the quality of their participation in the whole range of collaborative professional development opportunities they are given in the day-to-day life of the school. That's quite a different approach to evaluation than we see in other systems.

MT: Perhaps one way of summing it up is that you want a system that is more than the sum of its parts, one in which a lot of thought has been given to the way the parts and pieces of the system fit together and support one another. It sounds to me as though one of the things that makes Shanghai so different is a real focus on learning and teaching and another is the creation of a truly professional environment for teachers and teaching. Do you think that's true Kai-ming?

KC: Yes. A genuine concern for learning is essential. That transcends any culture. It relates to whether or not, when a student can pass examinations, even with high scores, they have really learned what is expected. Real learning requires understanding, and understanding is reflected in effective application of the knowledge. This is exactly where PISA is a more advanced means of assessment. In PISA, broadly speaking, it is the application of knowledge, rather than the amount of knowledge in stock, that is assessed.

In that context, teachers have to be perceived and respected as professionals on learning. Teachers in the top-performing countries are very professional. Professionals' prime concern is the clients. They are expected to look at student learning as their core business. If we learn anything from PISA, it should be that we need to look at the way we treat teachers. Do you treat them as foot-soldiers—mere employees —or as professionals? If we treat them as employees, their prime concern will be their own interests.

MT: Ben, I think it would be hard for me to find a country that would say it is not focused on learning. Shanghai says that, too. What does Shanghai do that sets it apart?

BJ: If you go anywhere in the world, they will all say they focus on learning. The question is what does that actually means. If you ask specifically about the countries programs and policies, it is often hard to see the link to learning. There is a fascination in our country with school evaluations and accountability arrangements. Judging from the rhetoric, it all comes down to test scores. In Shanghai, in contrast, evaluation and accountability are focused on a very nuanced look at how children are learning in the classroom and the evaluator is asking how what the teacher is doing relates to the work the students are doing and what they are learning. This form of accountability has a very different focus and therefore produces a very different response from the school faculty.

KC: In rural areas in China, the dropout rate is increasing and student scores are dropping. Many local governments are eager to decrease the drop-out rate and improve student scores. But they do not go to the fundamental issues about why students are not learning and why students are not eager to go to school. They have not really thought through what it means to learn and what it will take to create a more effective environment for learning. I am really challenging the proposition that if you do everything you now do in schools a little more so, the students will do better. We need to stop grabbing at nostrums and be a lot more thoughtful about what it means to learn the kinds of very challenging things students are now expected to learn, and what kinds of learning environments are going to be needed to enable students to learn those things. If we really do that, we will have to rethink curriculum, assessment, pedagogy and many other elements of education policy and practice, and as we do that not get distracted from the act of learning.

MT: When I've looked at Shanghai, I've seen some things that are the results of recent policies but I have also seen a lot that has been done for a very long time. And it's not always easy for me to sort those out. What do you see in Shanghai's success that is specifically a result of very widely established practices and values in China (not just Shanghai) and what do you think might be the result of specific policies?

KC: I would say the system of teachers' professional development; the teamwork, the classroom observations, the teaching of lessons is traditional. The framework of teacher development has been there for at least a few decades. What is new is the national reform in the curriculum, and indeed its concept of "learning to learn". Implementation of the new curriculum is not without difficulties, but Shanghai is among the best at genuinely attempting some fundamental change. The Shanghai Municipal Education Commission has developed a conviction that traditional pedagogical techniques, which worked very well when what was expected was memorization and execution of standard algorithms, were not going to work if the aim was mastery of complex skills and the application of what had been learned to

novel real-world problems. So they set about to radically change the pedagogy. The Education Commission studied the early PISA reports very carefully and concluded that PISA provides a direction in reform of assessment that fits the reform in curriculum and pedagogy.

MT: Malcolm Gladwell makes the observation that to become an expert in anything you need at least 10,000 hours of experience, which comes down to about 10 years of experience. He also says that simply putting in time doesn't do it but you need the constant disciplined search for improving one's own performance. In many countries now, policymakers understand that much depends on teacher quality and they are starting to think about the quality of teachers coming into the system but the fact remains, that this won't change things for a while. So for all systems, we need to focus on the teachers that are already serving. It strikes me that what you are describing as one of the unique features of the Shanghai system—the continual professional development of teachers—might be a very big explainer of Shanghai's success. Do you think that's true? Which specific features of the continued education for teachers correspond to Gladwell's point that it is not just about being in the system longer but it's about the constant disciplined search for improving one's performance?

BJ: It's worth noting that Shanghai does not have the best initial teacher education in the world. Nor do the best of the best go into teaching as they do in Korea and Finland. I agree that the framework for teacher development has existed for many decades throughout China, but Shanghai has been particularly successful at developing an exceptionally effective system for the continuing, disciplined improvement of the practice of serving teachers. From that perspective, Shanghai may offer the world's best model for countries that want to build their reform program not around teachers coming into the workforce, but teachers who are already in it.

MT: A number of the top-performing countries have been working hard to raise the quality of the poor from which they are selecting teachers and no less hard to improve the quality of teacher education. Shanghai makes sure that their teachers—including their primary teachers—have a firm grounding in the subjects they will teach, but they are unique in their focus on providing support to serving teachers. Ben, what do you think about this emphasis on serving teachers?

BJ: The last results from the Teach for America results do indeed show that their candidates are being recruited from a higher cut of the high school graduates than the average American teachers. But you still get a very wide distribution in terms of teacher effectiveness. If you focus only on the teachers coming in, then you are really missing a big part of the ball game. You are playing a very narrow part of the field. If you compare a policy requiring master's degrees with Shanghai's policies and practices designed to improve the practice of serving teachers, I would say that the evidence favors Shanghai's choice.

Biographies

Kai-ming Cheng is professor and chair of education at the University of Hong Kong where he has also previously served as Dean of Education and Senior Advisor to the Vice-Chancellor. Recently appointed to China's State Advisory Committee on Curriculum Reform, he was also appointed as a member of the Hong Kong Education Commission, where he was instrumental in the comprehensive reform of the education system in Hong Kong that began in 1999.

Tom Corcoran is co-director of the Consortium for Policy Research in Education (CPRE) at Teachers College, Columbia University. Previously, he served as Policy Advisor for Education for New Jersey Governor Jim Florio, Director of School Improvement for Research for Better Schools, and Director of Evaluation and Chief of Staff of the New Jersey Department of Education.

Ben Jensen, School Education Program Director at the Grattan Institute in Melbourne, Australia, is a highly regarded analyst and commentator on school education. Previously, he spent five years in the OECD Education Directorate where his work focused on school improvement, teacher effectiveness, and how to measure school performance.

Vivien Stewart is Senior Advisor for Education and former Vice President of Asia Society. Over the past decade, she has visited China frequently, meeting with education officials at every level and visiting Chinese schools. Prior to joining Asia Society, Stewart directed the children, youth and education programs at Carnegie Corporation of New York. She writes and speaks extensively on education in the Asia-Pacific region.

Minxuan Zhang, President of Shanghai Normal University, is also deputy director of the Shanghai Education Commission. At present, Professor Zhang chairs the project of the open door policy framework design for Chinese international education in the future for the government of China. He is also Director of the Center for International Education Studies and Consultation at the Ministry of Education.

The Center on International Education Benchmarking, a program of NCEE, conducts research on the world's most successful education systems to identify the strategies those countries have used to produce their superior performance. Through its web portal, monthly newsletter, and a weekly update of education news around the world, CIEB provides up-to-date information and analysis on those countries whose students regularly top the PISA league tables.

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