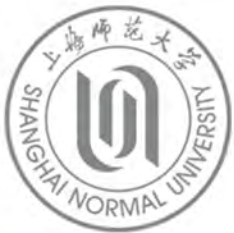


Developing Shanghai's Teachers

Teacher Quality
Systems in Top
Performing
Countries



CENTER ON INTERNATIONAL
EDUCATION BENCHMARKING
LEARNING FROM THE WORLD'S HIGH PERFORMING EDUCATION SYSTEMS



This report is one of a series of reports on teacher quality systems in top performing countries commissioned by the Center on International Education Benchmarking® of the National Center on Education and the Economy®. In addition to these reports, researchers have collected authentic tools used by the systems highlighted to assist policymakers and practitioners interested in adapting lessons-learned for their own context and culture.

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Developing Shanghai's Teachers

Minxuan Zhang, Xiaojing Ding and Jinjie Xu

January 2016

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The background features a series of stylized, semi-transparent orange and grey silhouettes. On the left, there are several skyscrapers, including one with a distinctive spherical structure. To the right, there are four human figures of varying sizes, representing a family or a group of people. The overall aesthetic is clean and modern.

Preface

Preface

Our research program, the Center on International Education Benchmarking, commissioned this report from Dr. Minxuan Zhang following Shanghai's impressive performance on the 2009 and 2012 PISA assessments. Dr. Zhang is currently Professor and Director of Research, Institute of International Comparative Education at Shanghai Normal University and former President of the University. Shanghai Normal University is one of two Shanghai universities that train teachers for the province. Prior to joining the faculty at Shanghai Normal, Dr. Zhang was the Deputy Director of the Shanghai Municipal Education Commission. Over the years, Dr. Zhang became the key architect of Shanghai's teacher development system. He and his colleagues are in a unique position to tell this story.

We wanted to understand more fully the policies, practices and history that have contributed to the impressive performance of Shanghai's schools, and to see what lessons emerge from the Shanghai experience for the United States. Shanghai's transformation in only 40 years is astounding – from a province with all its schools shuttered during the Cultural Revolution to one with near-universal participation in basic and secondary education and performance at the top of the international league tables. Creation of the high-performing system that now exists in Shanghai is the product of not one major reform, but years of careful and thoughtful shifts that responded

to particular historical circumstances and cultural contexts. Notwithstanding this complex history, three themes emerge as constants that were key to Shanghai's success. The first is policymakers' unshakable conviction that education would prove to be the most powerful driver of economic and social progress. The second was their conviction that it was both necessary and possible for all students in Shanghai to achieve literally at world-class levels, notwithstanding very low levels of funding relative to the top performers. And, third, was their belief that the key to high performance for Shanghai students was first-class teachers, organized, and supported in a way that encourages those teachers to get better and better at their work.

We wanted more detailed and nuanced information about how Shanghai trains and develops its teachers. We knew that this has been a priority for the province over the last two decades. But it was not until this report that we fully understood how much funding, time and energy went into raising qualifications and improving teachers' training and working conditions. The United States, like Shanghai, needs to raise the qualifications of its teachers, both those new to the profession and those currently teaching. Faced with the enormous challenge of training a teaching force for a school population in the millions, Shanghai's strategy of building learning into the daily work of a teacher and creating a teacher corps that could essentially train its own new teachers was a necessary and, likely, brilliant response.

Marc S. Tucker, President and CEO, National Center on Education and the Economy

The background features several stylized, semi-transparent orange and grey silhouettes. On the left, there is a tall, thin skyscraper with a distinctive spherical structure near the top. In the center, a person silhouette stands with hands on hips. To the right, a group of three people silhouettes is shown. The overall aesthetic is clean and modern, using a warm color palette.

Executive Summary

Executive Summary

After more than 40 years of reconstruction and reform since the end of the Cultural Revolution in China, education in Shanghai has achieved remarkable results. In the OECD's 2009 and 2012 PISA assessments, 15-year-old students in Shanghai topped every league table by a clear margin. This report details Shanghai's transformation from a province that closed all of its schools in the 1970s to one with near-universal participation in primary and secondary schools and secondary student performance that tops the world. Central to this transformation has been the creation of a high-quality teacher workforce. The teacher development system that was built over this period reflects not only years of careful and incremental reform, but also the design of a self-reinforcing system that continually improves.

The teacher development system in Shanghai has three components: the teacher career ladder, in-service training and development, and performance appraisal. Each of these components, envisioned as three sides of a triangle by the authors, reinforces the other components. The career ladder provides financial motivation and a pathway for career advancement for teachers; the in-service training enables teachers to move along the ladder as they improve; and the performance appraisal system evaluates and rewards teacher performance at each step of the ladder. The three components combine to incentivize, motivate and reward teachers throughout their careers. The system's carefully structured incentives also allowed Shanghai's government to use relatively limited public financing to build and sustain a very high quality teaching force in a relatively short period of time.

The Career Ladder

The first component of Shanghai's system is a career ladder for teachers, initiated in the late 1980s and revised several times since then. There are now 13 levels on the ladder including a recently added "professor-level" rank, which allows teachers

to serve as college and university professors. As teachers move up the ladder they have increasing responsibility such as serving as mentors and trainers for other teachers. A principal career ladder was also created in the 1990s, which includes five levels. All principals must first have been successful teachers and they are required to continue teaching even when they become principals. Teachers and principals move up their respective career ladders through a combination of satisfactory performance appraisals, satisfactory participation in required training, and other factors such as action research on relevant education issues, successful performance as mentors and trainers and time spent in rural areas and underserved schools.

In-Service Training and Development

In-service training is the glue that holds the system together. Teachers enter the profession as apprentices with a full-year induction before they are certified as teachers. During this induction year, they participate in 120 hours of training and are assigned a mentor who is a senior-rank teacher who has received specialized training in mentoring. Mentors have release time from teaching for this work. Mentors are evaluated on their work as a mentor in addition to participating in the evaluation of new teachers.

Once certified, all teachers in Shanghai are required to participate in training. The content of this training is decided by teachers in consultation with their principals and is largely composed of school-based professional development groups. There are three types of groups: teaching and research groups, lesson preparation groups and grade groups. In these groups, teachers prepare lessons, sit in on and evaluate colleagues' classes, share educational experiences, discuss teaching problems, conduct "action" research on issues at their school and learn new teaching technologies and skills. Significant time during the day is allotted to these meetings. Teachers also spend time in training outside of the school, in workshops or specific classes decided on jointly with principals.

Shanghai identifies and trains a corps of master teachers and principals (called Famous Teachers and Principals) to act as trainers and to teach at a set of model schools (called Base Schools) where more master trainers are trained. As part of this program, participants are sent abroad to shadow highly regarded teachers and principals in those countries.

Performance Appraisal

The performance appraisal system is aligned with the career ladder and the in-service training. The Shanghai Municipal Education Commission designed the framework for annual teacher and principal evaluations, but schools and principals have wide authority in implementing it and using its results. Teachers are assessed on their ethics, work ethic, knowledge of content, in-service training, research, workload, teaching quality, and ability to mentor new teachers. Alongside the career ladder are professional standards for teachers and principals that guide performance appraisal.

Fifty percent of the evaluation score is related to the teacher's work ethic and teaching performance as evaluated by the schools, and 50 percent is related to the teacher's research outcomes, personal professional development and influence as evaluated by district experts. There is a performance-based pay system linked to these assessment, with a basic wage (70 percent of the total) reflecting the cost of living, years of work and level of responsibility and a performance-based wage (30 percent of the total) designed by the schools in partnership with unions. In addition, Shanghai awards several honorary titles and also hosts teaching skill competitions. These both recognize outstanding teachers and provide motivation for teachers to improve.

Shanghai has deliberately built a system that is focusing on continuously upgrading the skills, credentials, and professional recognition of its teaching force. This emphasis on teacher development in order to drive the goals of the education system can serve as a model to policymakers everywhere.

The background features a light beige color with several stylized, semi-transparent silhouettes. On the left, there is a tall, thin skyscraper (the Oriental Pearl Tower) and a smaller figure sitting on a base. In the center, there is a rectangular building with a white window. On the right, there are three human silhouettes of varying sizes, representing a family or a group of people. The overall aesthetic is clean and modern.

Developing Shanghai's Teachers

1. Introduction

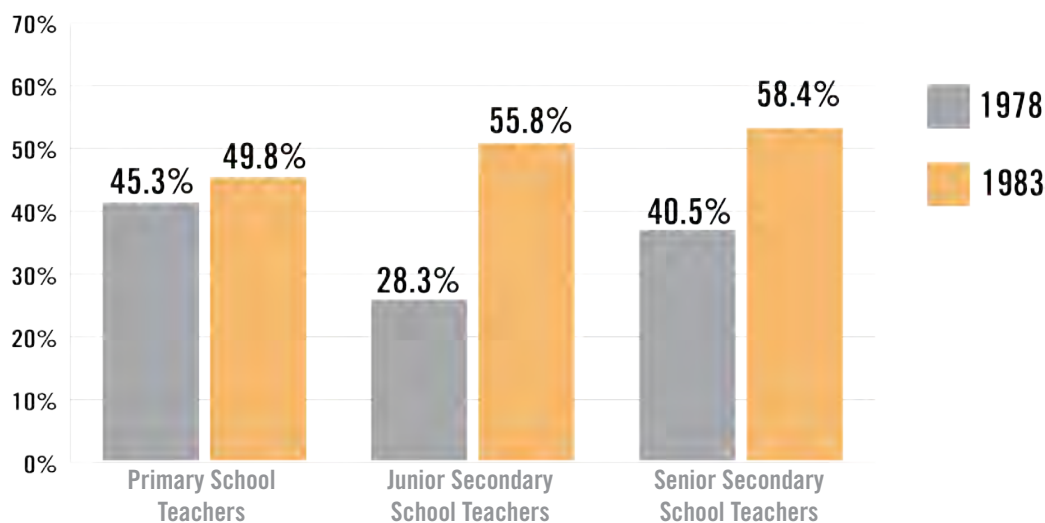
This report details Shanghai's system for developing its teachers, in response to a request from the National Center on Education and the Economy. After more than 40 years of reconstruction and reform, education in Shanghai has achieved remarkable results. In the OECD's 2009 and 2012 PISA assessments, 15-year-old students in Shanghai topped every league table by a clear margin. This report first briefly reviews the history of teacher development in Shanghai since the end of the Cultural Revolution before turning to how the current system operates.

The report envisions teacher development in Shanghai as a triangle, with the teacher career ladder, in-service training and development, and performance appraisal as the three sides. Each side of the triangle is connected to and reinforces the other sides. The career ladder provides financial motivation and a progression pathway for teachers; the in-service training enables teachers to move along the ladder; and performance appraisal evaluates and recognizes teacher performance at each step of the ladder. The three sub-systems combine to incentivize, motivate and reward teachers throughout their careers. The system also responds to the needs of government. The system's

carefully structured incentives allow government to use relatively limited public financing to motivate all teachers to continuous enhancement of their teaching quality. Shanghai and its people are the ultimate beneficiaries.

Shanghai, as China's leading economic city, has always had a special status in the country. It has been given flexibility to experiment and pilot ideas that are then often expanded nationally. But even Shanghai's teacher development system was not built overnight. It was developed step by step over the last 30 years, in response to China's broad and evolving goals for economic development and for an education system that could support this development. It is noteworthy that the teacher development system emerged through China's economic planning process. Starting with the 5-Year Plans of the 1950s, broad economic initiatives tied education to economic and social goals for the nation. China started to develop five-year plans for education specifically in the 1990s, and Shanghai followed with a five-year plan for education in the province in 2001, tying its education plan to its economic and social development plans. Education is seen as a crucial contributor to economic growth and social change, and teachers and principals are regarded as key agents to realize these advances.

Figure 1 Percentage of Educators Who Reached the Governmental Standards of Educational Qualifications, 1978 and 1983



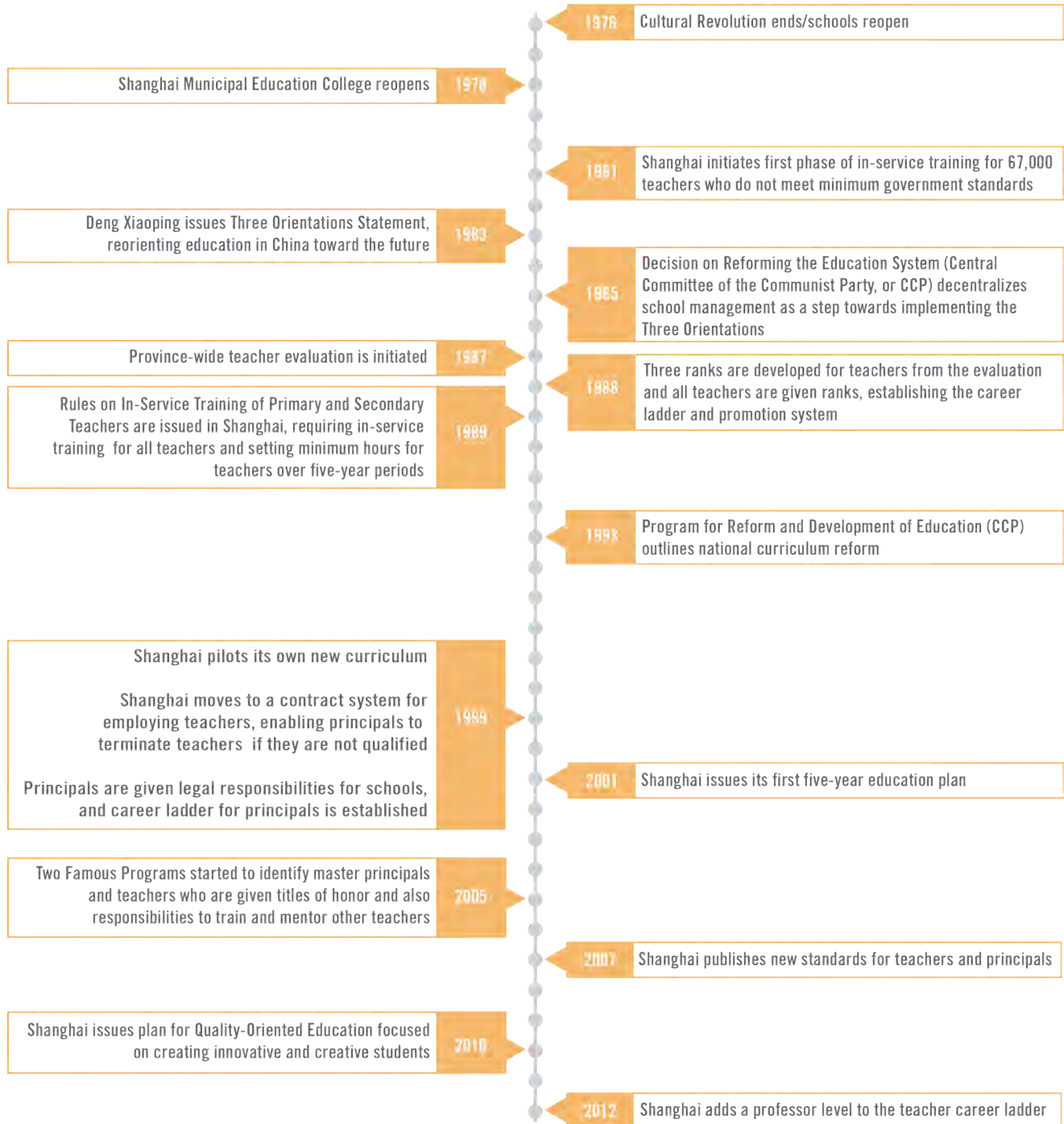
Source: Li, 2010

2. Historical Context

After the Cultural Revolution ended in 1976, the critical issue facing Shanghai's education system was how to provide a qualified teaching force for all the schools that were being reopened and expanded. The initial work of simply re-opening teacher training institutions (teachers' colleges for

secondary teachers and secondary normal schools for primary and kindergarten teachers) took several years. It became clear, though, that just bringing new teachers into the workforce through the traditional training system was not enough. Shanghai needed to upgrade the skills of the teachers already in the classrooms and to rethink the way teachers were trained.

Figure 2 Timeline: Development of Teacher Development System



The provincial government took this on step by step. In 1981, 67,000 teachers whose qualifications were not up to the government standard were identified and the government initiated various kinds of required training for them. The training was provided through the network of education colleges and included full-time and part-time training, training via TV, lectures on special topics and lesson preparation by subject. Over just a few years, the province raised the qualifications of a significant percentage of its teachers to meet government standards (See Figure 1, page 7). It was at this time that Shanghai also created a set of honorary titles to commend outstanding teaching, meant to incentivize improvement and enhance the social status of teachers, a theme that continues to the present day (Li, 2010: 97).

By the mid-1980s, Shanghai and the rest of China had decentralized school management. Decentralization was seen as a way to reorient schools that were centrally controlled and focused primarily on national exams, as well as a response to Deng Xiaoping's proclamation that education should be oriented toward the needs of modernization, the world and the future. The shift meant that schools had new levels of authority to decide how and what to teach. In turn, they had to reorganize themselves and redefine the responsibilities of principals and teachers.

Along with decentralized management came a new national curriculum that was very different from the old one. It not only expanded learning areas to include language and literature, mathematics, natural sciences, social sciences, technology, and sports and fitness, it also focused on ethics and character development, development of cognitive and learning skills such as problem-solving, physical education, arts and culture, and social learning, which meant community service and learning about the community.

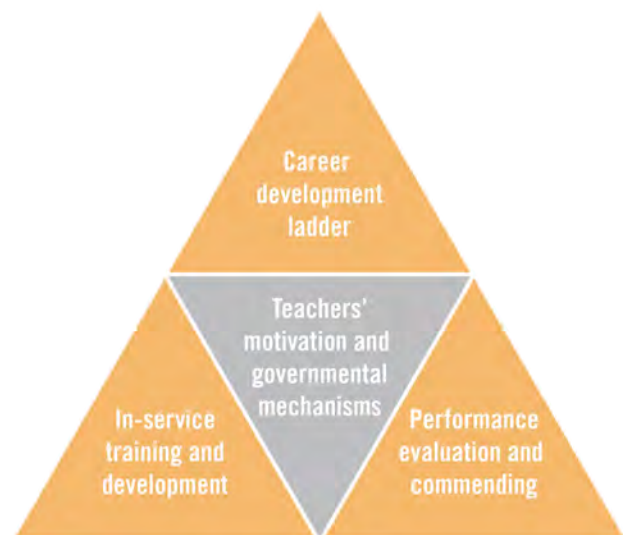
The challenge for teacher development was how to transform the teaching force to cope with this shift. A large percentage of teachers were still below the current government teaching qualification requirements, but principals and teachers now

would be required to manage their schools and classrooms on their own and to implement a whole new kind of curriculum system-wide. This was, Shanghai officials acknowledged, a big hurdle. And it required a big response.

Over the next decade, Shanghai took these seven major steps:

1. Launched a system-wide evaluation of all 140,000 teachers and awarded titles based on this evaluation;
2. Created a teacher promotion system based on the new set of titles;
3. Mandated ongoing training for all teachers, requiring 240 hours over five years for most teachers and 540 hours over five years for senior secondary teachers;
4. Made employment contract-based, which meant teachers who were not qualified could be terminated;
5. Made principals “legally” responsible for their schools and created a career ladder/promotion system for principals with five ranks and ten levels to go along with their new levels of responsibility;

Figure 3 Triangle Interactive Mechanism for Teacher Education and Training



6. Developed new standards for teachers and principals so that qualification was based not just on an education certificate but on assessment of whether they met a set of competency tests, such as the ability to design a lesson, to manage a classroom and to assess student learning (Shanghai Municipal Government, 2007); and
7. Formalized the teacher career ladder and added more honorary titles to recognize outstanding teachers and identify teachers who could mentor new teachers.

The rest of this report will discuss the ways these pieces now fit together and function as a triangle system (see Figure 3, previous page).

3. Teachers' Professional Career Ladder

In Shanghai, teaching is viewed as a long-term professional career. In contrast to systems that suffer from pervasive teacher attrition, Shanghai teachers expect that they will devote 30 to 40 years to the profession. Therefore they need ongoing professional development, recognition of their achievements and their devotion to the cause of teaching, and the social status and compensation their skills and contributions merit. To achieve these goals of making teachers feel supported, recognized, and valued, Shanghai created a career

ladder system for professional development. It is a comprehensive career framework that spans entry-level to senior classroom teachers as well as school principals.

History of the Career Ladder Structure

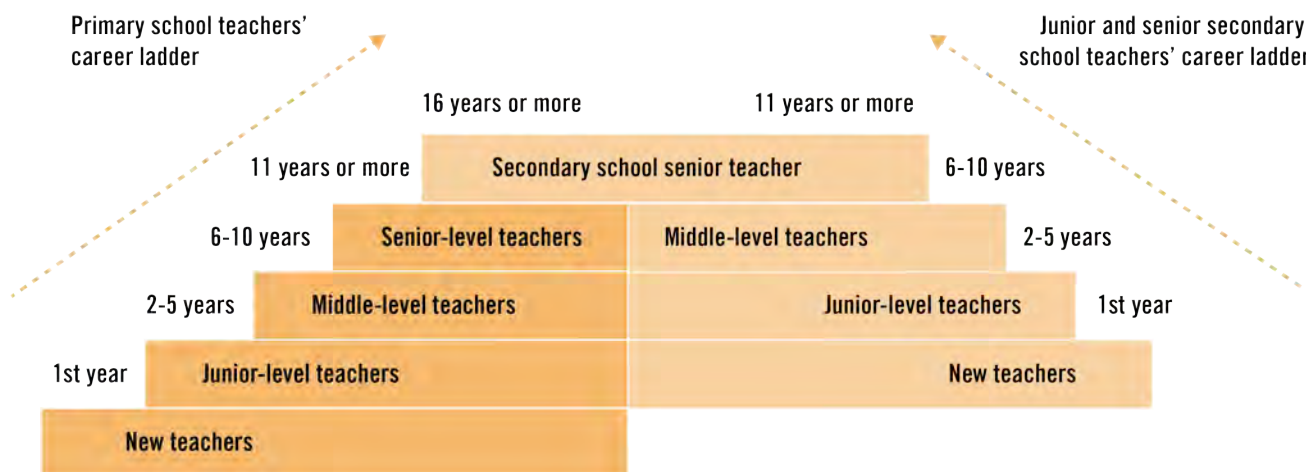
Shanghai piloted its professional ladder for teachers in 120 schools in 1986 and put forward a more detailed, revised program in June 1987: Trial Measures for Building a Judging Panel in Deciding Primary and Secondary School Teachers' Profession Grades in Shanghai and Trial Measures for Primary and Secondary School Teachers' Employment Requirements in Shanghai. These served as the first teacher career ladder policies in Shanghai's history.

Figure 4, below, shows the first career ladder, established in 1986.

This initial system was updated several times after the late 1980s. Reforms to the initial ladder included:

- Integrating the professional career ladder system for teachers from primary and secondary schools into one system;
- Introducing a senior-level title into teachers' career ladders, which also made senior-level teachers the equivalent of a professorship in a college or university;

Figure 4 The Career Ladder for Primary and Secondary School Teachers Established in 1986, Shanghai



- Expanding responsibilities for senior-level teachers to include some management roles; and
- Updating the ladder to reflect new employment requirements, new professional standards for teachers and new evaluation approaches in primary schools and secondary schools.

The remainder of this chapter traces the career of a Shanghai teacher from qualification through induction and requirements for promotion, and the ladder for a principal.

Professional Qualification

American audiences might not typically think of professional qualification exams as a component of a career ladder. However, in Shanghai it is the first step and one of the most important. A key goal of the career ladder is increasing the status of teachers in society. A core strategy in support of that goal has been developing rigorous qualification requirements that ensure the profession and the public that teachers are among the most highly skilled members of society. Over the last 20 years, increasing the rigor of initial qualification and

training of Shanghai's teachers has been a consistent priority for education reform.

Issued in 1995, the Regulations on Teachers' Professional Qualification was initially piloted in Jiangsu province and Shanghai, and then nationally in 2001. These regulations require that teachers at all levels have a bachelor's degree or above, except for primary school teachers, who are permitted to have an associate's degree. The province is gradually transitioning to requiring primary school teachers to also have a bachelor's, and senior secondary teachers to have a master's degree.

One of the more recent moves has been to require more rigorous exams that screen candidates on their knowledge, skills and dispositions to begin teaching. In 2012, the Implementation Plan for Pilot Reforms on the Qualification Examination for Teachers in Kindergarten, Primary and Secondary Schools in Shanghai was formulated by the Shanghai Municipal Education Commission. This plan stipulates that all applicants for teacher certificates, from kindergarten to senior secondary school, must undergo certificate examinations, which consist of both a written test and an interview. The written exam usually includes two or three tests covering pedagogy, teaching methods

Figure 5 The Reformed Career Ladders for Primary and Secondary Teachers in 2013, Shanghai

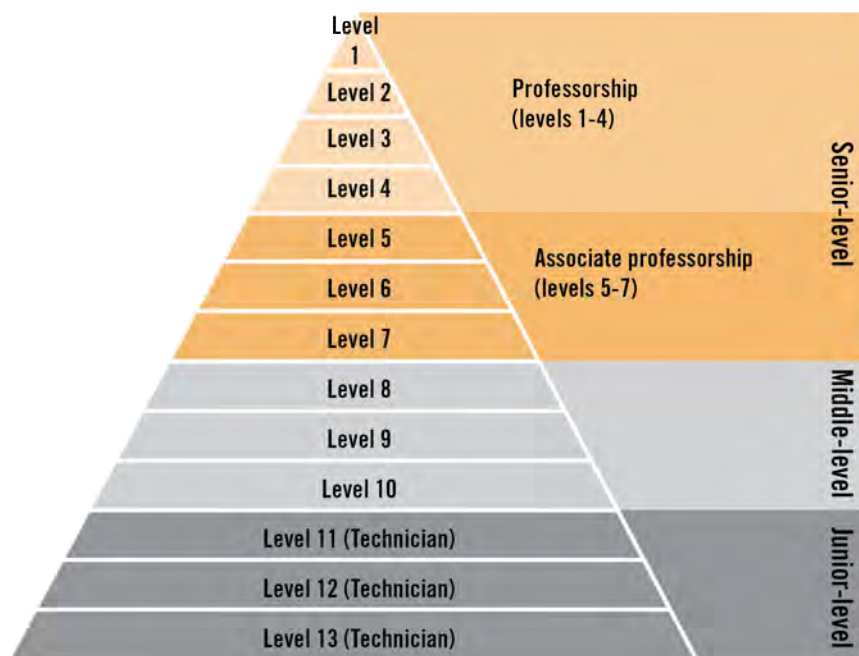


Table 1 Testing Domains for Primary and Secondary Teacher Qualification

Category	Domain 1	Domain 2	Domain 3
Kindergarten teachers	Comprehensive test for general and professional education	Teaching and childcare; knowledge and skills	
Primary school teachers	Comprehensive test for general and professional education	Teaching and childcare; knowledge and skills	Subject knowledge and teaching ability
Junior secondary school teachers	Comprehensive test for general and professional education	Teaching and childcare; knowledge and skills	Subject knowledge and teaching ability
Senior secondary school teachers	Comprehensive test for general and professional education	Teaching and childcare; knowledge and skills	Subject knowledge and teaching ability

Source: Division of Human Resources, Shanghai Education Commission (2012)

for a particular subject, and psychology, each lasting 120 minutes. The 20-minute interview includes a structured interview protocol along with a teaching-scene simulation (Shanghai Education Commission, 2012).

The Teacher Certificate Examination is intended to ensure that applicants have the ethics, knowledge and skills the profession requires. The written tests cover educational knowledge, including psychology, education concepts, pedagogy, work ethics and relevant education laws and regulations; specialized subject matter knowledge; and teaching skills, including reading, oral expression, logical reasoning, information processing, classroom management and other relevant abilities.

The interview focuses on the applicant's professional merits, including ethics, manners, speaking ability and basic teaching know-how like designing, carrying out and evaluating a classroom session. Specific components change according to the content area and grade level the candidate wishes to teach. For example, the interview for kindergarten teachers covers skills such as singing, piano playing and painting.

Induction & Training for New Teachers

Until 2011, earning a teacher certificate meant that the candidate was immediately considered a qualified teacher. In 2012, Shanghai changed this so that teachers only attain "qualified" status after a one-year induction program (Order No.56, Shanghai Education Commission, 2013).

The induction program has four parts: professional standards and ethics; teaching practice and classroom experience; classroom management and moral education; and teaching research and professional development. Only after completing the training are trainees considered certified teachers.

Each year, district and county education bureaus estimate their numbers of new teaching staff and the support they will require in order to plan the induction year training. Representatives from regional training centers and teachers' colleges then assess the newly trained teachers, along with their employers. Only candidates who pass this test can advance beyond the probationary stage to become qualified teachers.

Requirements for Promotion

Teachers on the career ladder face detailed grading requirements. For example, secondary school senior teachers aspiring to be graded “excellent teachers” are rated on:

- **Work ethic.** This is the most important standard, and each school board sets detailed requirements.
- **Teaching competence and skill in academic research on pedagogy.** The candidates are expected to have mastered a sound theory of teaching and to publish high-level professional papers or other research results in publications at the district level and above. They must research teaching improvement at the municipal level and be able to summarize methods in real teaching contexts.
- **Education qualifications.** A bachelor's degree or above is required. (An associate's degree or above is required for primary and kindergarten teachers, who are also being strongly encouraged to earn at least bachelor's degrees, as noted earlier.) Master's degrees are more and more common.
- **Experience at lower levels.** Applicants should have at least five years of teaching experience at the middle-level professional grade.
- **Preference.** Senior secondary teachers with teaching experience in primary schools

or rural areas have an edge for promotion over their counterparts. Teachers who support other teachers in China's poor western provinces and rural areas also have precedence.

- **In-service training.** All candidates must complete required in-service training programs with good results.

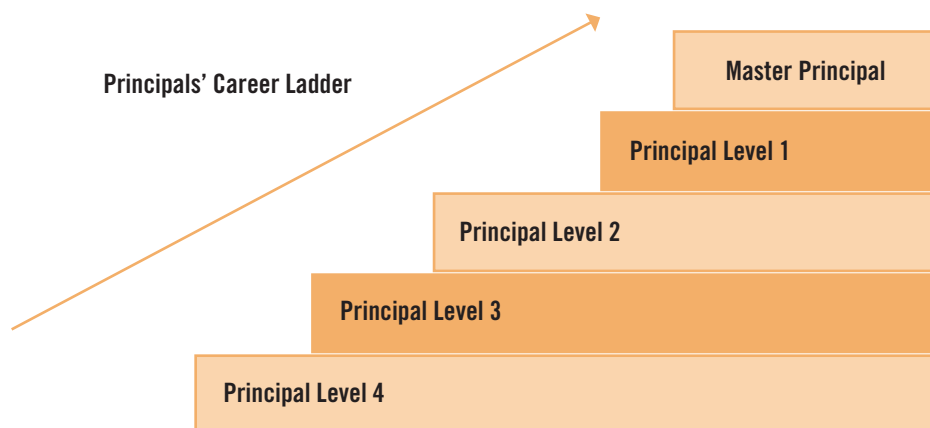
Career Ladder for Principals

The idea for developing a career ladder for principals was put forward in 1993 and piloted that year in the Jing'an District. It divided principals' professional rankings into five levels of 10 grades, specifying each level's qualification requirements, evaluation categories and scoring indicators. In 1995, the Education Commission and Shanghai's Personnel Bureau amended and expanded the ladder to five levels of 12 grades, adding a Master Principal above Level 1, the highest level (see Figure 6, below).

A principal is typically at each grade for about three years, but excellent performance means he or she can be promoted one grade band a year. A high Master Principal title honors outstanding first-level principals.

By 2000, the career ladder was in use across the province. About 30 percent of principals in Shanghai are currently senior-level principals and about five percent are Master.

Figure 6 Career Ladder for Primary and Secondary School Principals



Requirements for Principal Ranking

To become a principal, a candidate must first reach certain senior professional levels on the teacher career ladder, in order to demonstrate teaching skills and dedication to the profession needed for school leadership.

Principals evaluated “excellent” for one year or “qualified” for two years can move up one grade in their current levels. Principals at the highest grade in level 3 may apply for level 2 ranking after a three-year stay. Those in level 2 may apply for level 1 after three years, while those in level 1 can apply for the Master Principal title after two years.

All principals are required to keep their skills up-to-date by continuing to teach classes, even though their main responsibility is administration. Primary and secondary school principals must teach two or more classes per week, while kindergarten principals must teach at least one half-day of class per week.

4. In-Service Training and Development

Types of In-Service Training and Development

In-service training and development is a crucial component of the teacher career ladder and required for advancement. According to the Regulations on the Further Study for Teachers in Shanghai's Primary and Secondary Schools, teachers or principals applying for higher-level professional titles must complete specific training programs, including study-abroad programs.

Shanghai defines professional development for teachers as continuous learning over their entire careers. Different types of in-service training are required for teachers at different stages.

Induction Program for New Teachers

Shanghai requires all new teachers to complete a one-year internship training course. They receive 120 hours of in-service training, taking courses at universities and teachers' training colleges and participating in school-based training.

In many schools, principals select senior teachers to be “masters” or mentors for new teachers. Masters provide their new apprentices with guidance on course preparation, coursework evaluation, organization of student activities and so on. They observe new teachers' classes and help them deal with problems, while the new teachers observe their masters' classes in turn to learn from the masters' techniques and experiences.

It is widely acknowledged in China that guidance from masters is crucial for the growth of new teachers. Many provinces even require senior teachers to supervise new and other inexperienced teachers as a condition for professional promotion. In Shanghai, virtually all schools ask senior teachers to supervise and guide new teachers (Shanghai Academy of Educational Sciences, 2013).

Teachers' In-Service Training

Shanghai has standardized teachers' in-service training since 1989 when all new teachers were required to finish at least 240 hours of training in their first five years. The requirement was raised to 360 hours in 2011. The amount of training required is tied to the career ladder, with more senior teachers required to take more training to advance. After the first five years of teaching, all teachers must undergo at least 360 hours of in-service training every five years to upgrade their educational philosophy, skills and capacities. For secondary school Senior Teachers, the amount of training required rises to 540 hours every five years.

Some training requirements vary according to teachers' roles and responsibilities. For example, new school principals complete an additional 60 hours of training after taking on their leadership roles (Shanghai Municipal Education Commission, 2012: 126).

The content of the trainings is quite rich. Topics include recent developments in educational theory and practice, teaching skills, educational technology, social research methods and social sciences. Sometimes special trainings are organized for teachers working under particular conditions.

For example, in 2010, Shanghai organized four types of trainings for teachers of different experience levels who were teaching mostly children of migrants in rural areas (Shanghai Municipal Education Commission, 2013: 145). There are also special trainings for teachers with particular responsibilities, such as principals, class advisers and teacher trainers.

The “Two Famous Program”

In 2005, Shanghai launched the “Two Famous Program” to build a world-class teaching force. It trains potential future leaders in education and teaching. Each cycle of the program takes five years. Trainees receive general training and training at a base school.

General training covers professional ethics and values, comprehensive literacy, educational philosophy and up-to-date pedagogical theories. Base schools are schools where these master principals and teachers work and supervise the trainees. In 2013, there were 13 base schools for principal trainees and 49 base schools for teacher trainees (Shanghai Municipal Education Commission, 2012: 156).

In the base schools, trainees design and implement teaching or administrative tasks and write reports and papers. They also participate in their own schools’ teaching reforms, and some study for a master’s degree in education.

Learning from best practices abroad is considered a crucial part of developing the Shanghai educator workforce. The “shadow headmaster” and “shadow teacher” programs send trainees abroad to learn from master teachers and principals in other countries. In 2008, 10 headmaster trainees participated in the first session of the “Shanghai-California Shadow Headmaster Project” and received five weeks’ training in California public schools (Shanghai Municipal Education Commission, 2009: 147). Some trainees also study for an overseas master’s degree. In 2011, 20 headmaster trainees flew to Singapore to pursue master’s degrees in education administration at Nanyang Technological

University (Shanghai Municipal Education Commission, 2011a: 132).

Providers of In-Service Training and Development

A variety of providers conduct teachers’ in-service training, including normal universities, teachers’ colleges, comprehensive universities, teachers’ training institutes and an increasing number of on-line training institutes, private providers and professional organizations. The following sections outline the contributions of each of these providers.

Universities and colleges: Universities and colleges are the major degree-awarding agencies in China. Of the 68 universities and colleges in Shanghai, however, only two provide pre-service training for teachers: East China Normal University and Shanghai Normal University. But education levels of teachers in Shanghai have risen continuously in the last 40 years, chiefly for two reasons. First, an increasing number of university graduates have focused on education. Second, in-service teachers are eager to upgrade their rankings to higher levels through training. Many put great effort into their professional training, spending their weekends or summer holidays in the courses.

Policies such as the teacher career ladder have created substantial incentives for teachers to pursue these higher ranks. In 2014, 13 percent of senior secondary school teachers in Shanghai had a master’s degree. The corresponding percentages for junior secondary school teachers and primary school teachers were six percent and two percent, respectively. These are all significant increases in the number of teachers with master’s degrees.

Shanghai has had a “specially-appointed adjunct professor” system since 2008. Master principals and teachers are named adjunct university professors to provide teacher trainees with frontline knowledge and skills (Shanghai Municipal Education Commission, 2007). These professors bridge the longstanding expertise of the universities with practical knowledge from their work on the ground in schools.

District teacher training college In addition to universities, each district or county in Shanghai has established a teacher training college. Many also play an important role in teaching-related research. Teachers at these colleges offer training programs and courses and also spend a lot of time visiting schools, where they continuously develop their firsthand knowledge of teaching and education. They can use what they learn during these visits to help them coach teachers through real problems of teaching practice, thereby serving as instructional coaches.

The teaching colleges are a source of resources, tools, tip sheets and other valuable materials via their websites. These include videos of high-quality courses, coursework, analyses of public examination results, test paper generation and e-books. The websites often have an online space for teachers to communicate in a virtual community to discuss problems of practice, to troubleshoot and to trade advice with one another.

School-based training: In China, teachers' school-based development is considered most important. It is in schools that teachers accumulate and share teaching experiences, discuss and solve challenges and problems they encounter in teaching, and find ways to facilitate students' development. As the Shanghai Municipal Education Commission put it, "School shall become the basis of teachers' professional development. The most important task of a headmaster is building a teaching team. School shall integrate the employment and use of teachers with the fostering of teachers, and make the school a place for common growth of teachers and students, and become a learning organization" (Shanghai Municipal Education Commission, 2007). The importance of on-site training is reflected in regulations that stipulate that up to 50 percent of a teacher's required training hours should come through in-school training (Shanghai Municipal Education Commission, 2011b).

Shanghai's education community also recognizes that school-based training is particularly important because it enables teachers to collaborate with one another. In Shanghai, the notion of a "teacher

professional development community" was used in 2011 to describe schools as a place where teachers gain professional growth by participating in various development groups with their colleagues.

At least three types of school-based professional development groups are in operation: teaching and research groups (TRGs), lesson preparation groups (LPGs), and grade groups (GGs). TRGs are composed of teachers who teach the same or similar subjects. They discuss problems they encounter in teaching that subject and share their experiences. In large schools where each grade comprises many parallel classes, TRGs are divided into LPGs to allow the joint preparation of lesson plans. Schools usually also have GGs in which teachers of the same grade gather to communicate.

Activities of the TRGs include preparing lessons, sitting in on and evaluating colleagues' classes, sharing educational experiences, discussing teaching problems, conducting research and learning new teaching technologies and skills.

They meet frequently. According to a survey of junior secondary school principals in Shanghai, school-based professional development groups organize professional development activities once a week in 44 percent of the schools. In 52 percent of the schools, the groups organize activities twice a week.

The principal of each school is a key player in charge of teachers' development. Principals participate actively in the meetings of teaching and research groups and in observing classrooms. In the last term, 44 percent of the principals sat in on 31-40 classes, 25 percent sat in on 41-50 classes, and 15 percent sat in on even more classes. These observations are traditionally viewed as more of a professional development opportunity than part of a formal evaluation. When principals were asked how they delivered feedback from their classroom observations to teachers, 75 percent responded that they organized small-scale seminars; nine percent gave feedback in written form; six percent communicated with teachers immediately after the class; and only three percent said they included the

results in teachers' performance evaluations and used them in making promotion decisions.

Professional development schools: Teachers' professional development schools (TPDSs) began to emerge in 2001 with the Shanghai Experimental School. Based on the success of this pilot program, the Shanghai Municipal Education Commission encouraged schools to set-up TPDSs in all districts in 2007. University professors, researchers and schoolteachers gather in these schools for practical research on the most effective ways to deal with real problems of practice.

The schools receive a special designation from the government, demonstrating that they are viewed as a priority strategy for developing teachers' professional capacity. Furthermore, they receive a special funding allocation using professional development dollars allocated from municipal and district/county-level governments (Shanghai Municipal Education Commission, 2007). By 2013, the municipal government had designated 114 schools as TPDSs (Shanghai Municipal Education Commission, 2013: 156).

Since 2009, the government has selected and designated the best TPDSs as sites for internships for pre-service student teachers. The government also selected a set of schools as in-service training bases for teachers with particular responsibilities, such as special education, moral education and art education. The purpose is to offer all teachers high-quality opportunities for professional development (Shanghai Municipal Government, 2012).

Action Research by Teachers and Principals

In Shanghai, every reform to education and teaching has been closely connected with action research conducted by teachers and principals. Before any changes are implemented across all schools, the government selects a few schools for pilot experiments and does research on the pilots to improve the program.

Pilot schools and their teachers play an important role here. They observe program implementation, diagnose obstacles and try to tackle the problems.

For example, in an experiment in digital learning environments, three districts were selected for the pilot. In one district, 18 schools participated in the pilot and developed e-learning units for five textbooks (Shanghai Municipal Education Commission, 2013: 177).

Action research is broader than just evaluating pilots for scaling and improvement, however. Teachers and principals always encounter various problems in daily work. These problems motivate the educators to research a way out. For example, a principal in a school with many low-income students might design research to learn how best to motivate them. To encourage action research, Shanghai has included "conducting educational research" as one of the criteria for selecting model schools. The Shanghai Municipal Education Commission selects and sponsors over 200 research projects on education each year.

Schools now conduct a significant number of research projects. In 2013, more than 100 research projects were conducted by schools. The number is more than double the number conducted in 2010 and represents a rising percent of the overall number of school research projects which are also conducted by higher education and research institutions.

In addition, the districts and counties sponsor journals of basic education, which often publish papers by teachers and principals. The papers generally show the results of teachers' and principals' action research. Such research was not originally intended to generate new knowledge: teachers and principals merely sought to improve their own practice by finding the most effective existing methods. Nevertheless, the trend towards publishing the results shows that teachers are disseminating their results and increasing the profession's collective knowledge.

Action research has become a crucial part of Shanghai's schools. A survey of principals found that almost all schools have drafted regulations about the conduct of educational research, supported teachers' participation or applications for research

projects, set up research teams on teaching various subjects, included teachers' research performance in their performance evaluations, and/or allocated funds for the research.

While training is offered in a variety of settings in Shanghai, there is much discussion about how best to deliver it. According to a survey of principals, the closer the training location is to the schools, the more effective it is. More than 90 percent of principals thought the trainings based at schools were "absolutely important" whereas only about 10 percent of those conducted at higher education institutions were rated "absolutely important". More than 50 percent of those conducted by teacher training colleges were ranked that high as were about 30 percent of those at municipal educational research departments.

5. Teachers' Performance Evaluation

As noted earlier, Shanghai views an effective teacher policy as a triangle with three sides. The final side in this framework is evaluation of teachers' performance. Currently, Shanghai has three ways of recognizing and rewarding teachers' performance. First, it awards honorary titles such as "Special-Grade Teachers" (master teachers) and "leading teachers." This component is critical because both government and schools agree that a core strategy for educational improvement is to raise the image of educators as heroes and to glorify the profession to the public at large. This reduces attrition, attracts strong candidates into teaching and motivates teachers to continuous improvement.

Second, the government manages a regular evaluation system that includes routine annual observations and evaluations as well as special evaluations tied to promotion on the career ladder. And third, the government hosts contests in teaching skills to raise teaching capacity, encourage teachers to improve and to allow teachers to demonstrate their skills and professionalism to the public.

It is worth noting that of these three strategies, only the second (annual routine observations)

would be recognizable to most Western audiences as a component of "performance evaluation." To the Chinese, honorific titles and contests are also components of a robust evaluation system, which they see as inextricable from raising professionalism and status. These components connect with the two other sides of the triangle — in-service development and a career ladder — to form a professional system that motivates teachers to improve while helping them to feel honored and valued.

Honorary Titles for Excellent Teachers

To cultivate respect for teachers and to enhance their sense of being valued, many awards and honorary titles have been established for excellent teachers and educators. Award ceremonies are hosted by the municipal government, the district and county authorities and the schools. Winners of municipal awards are usually former district/county or school-level winners. Some municipal award winners are recommended for national awards and medals — the highest honor for a Chinese teacher.

Shanghai Education Hero/Heroine

This award, the top honorary title in Shanghai, was established to commend Shanghai teachers and educators who have made outstanding contributions in teaching, research and classroom management techniques and who command a very high reputation at home or abroad. Municipal governments evaluate teachers for the award every five years. Ten winners are chosen from basic education and another ten from higher education. All are granted certificates and a monetary bonus, and all are publicized as model educators in various ways that hold them up as examples for their counterparts.

Selection as an Education Hero or Heroine is competitive. Criteria focus on character and virtue, good teaching practice, research quality, and a mindset of continuous improvement. More specifically, a candidate must be:

- Loyal to the nation;
- Dedicated to education;
- A model of virtue for students and peers;

- A contributor to the development of education;
- Persistent in teaching practice;
- A promoter of educational knowledge and talent cultivation;
- Active in seeking breakthroughs in educational research, with achievements that are put into practice and solve real problems; and
- Brave in changing some taken-for-granted ways, improving school management using the latest research, and achieving great progress (Shanghai Municipal Education Commission, 2002).

Shanghai Gardener Award

Only slightly less prestigious than the Education Hero Award is the Shanghai Gardener Award. This award was set up in 1988 for teaching staff in kindergartens, primary and secondary schools, vocational schools, special education schools, private schools, off-campus educational institutions and the Shanghai Academy of Education Science. The Shanghai Municipal Education Commission and Shanghai School Teachers Award Fund jointly organize the work of evaluating candidates for the award and selecting winners (Order No. 48, Shanghai Education Commission, 2002).

Selection criteria include morality, skill in teaching methods, curriculum development, and participation and leadership in continuous improvement for themselves, their peers, and their schools. Awardees are:

- Able to implement the idea that education is “for every student’s life-long development,” to adhere to the socialist core value system and to integrate moral education into regular teaching procedures;
- Actively engaged in reform and development in curriculum and textbooks, in cultivating students with a creative spirit and capable practices; in improving curriculum, teaching methods, classroom management and evaluations; in raising teaching quality and

taking a leading role; and in educational research based upon teaching experience; and

- Seeking to improve student management and facilitate students’ potential development; to promote balanced and sustainable school development; and to create favorable conditions for teachers’ professional development and participation in teaching reforms, student management, laboratory building, personnel and service support.

Special-Grade Teacher (Master Teacher)

The Shanghai education system also designates permanent titles of “Master Teacher” or “Special-Grade Teacher.” The Regulations on the Evaluation of Special-Grade Teachers, set up by the Ministry of Education in 1993, define the quality of a master teacher, the evaluation requirements and the range of candidates, and the evaluation procedures and methods. These regulations are a starting point for developing metrics for standard annual evaluations. In 1997, the Shanghai Municipal Education Commission put forward detailed definitions on the evaluation and management of master teachers, the bonuses for which they were eligible, and the added responsibilities they would be expected to undertake. Master teachers are required to:

- Be good at integrating moral education with subject teaching and to be active in reforms of curriculum, teaching and educating;
- Have a good reputation and respect among peers;
- Have rich experience as a “secondary senior-level teacher” with at least ten years of subject teaching, while teachers of moral education should serve as “class mentors” for at least 12 years; and
- Work in at least two schools, ensuring teachers’ mobility and the fair allocation of teaching resources with teachers with long-term experience in rural areas preferred (Order No.71, Shanghai Education Commission, 1997).

The municipal government grants winners of the “master teacher” title certificates and special allowances. Their retirement age can be postponed, and when they do retire, they can be reemployed to compile textbooks and to train new teachers.

Local policymakers can also create additional awards and honorary titles at the district/county level, using these to motivate teachers in ways that reflect the locality's specific priorities and initiatives. Titles such as “new star teacher,” “senior advisor,” “subject leader” and “district gardener” are used broadly.

Take Putuo District of Shanghai as an example. In this district:

- The honorary title of “new star teacher” goes to teachers with at least three years' experience and excellent performance in teaching or developing innovative strategies.
- The “good teacher” title recognizes good teachers with at least five years of experience.
- The honorary title of “subject leader” aims to encourage participation in peer mentoring. Subject leaders are also encouraged to lead in-service training teams to train leading teachers, to lead research groups and to develop course syllabi and teaching materials.

Ongoing Evaluation of Teachers' Performance

Awards only go to a small number of teachers. The appraisal system that regularly reviews the performance of almost every teacher in Shanghai also recognizes teachers' good performance, and is closely related to teachers' promotion up the professional ladders. The system is linked with teachers' in-service training so that teachers who want to improve their performance and quality feel a strong incentive to join the various trainings and apply their lessons.

The annual evaluation covers teachers' work and accomplishments over the past year, so that each one has a basis for reflection to use in professional

development. Annual performance records are then used as the primary reference for decisions on continuing employment, promotion and salary.

The Shanghai Municipal Education Commission developed the overall framework for annual evaluation, but schools and districts implement it and use its results. The evaluation indicators include morality, work ethics, education and knowledge, in-service training, research, workload, teaching quality, and guiding new teachers. In some cases, indicators may be added to reflect any additional knowledge or skills necessary for teachers of specialized subjects. Fifty percent of the evaluation score is related to the teacher's work ethic and teaching performance as evaluated by the schools, and 50 percent is related to the teacher's research outcomes, personal professional development and influence as evaluated by district experts.

Performance-Based Wage System

Teachers' evaluation results are primarily used as tools for reflection and ongoing professional development. Within the last ten years, Shanghai also began to pay more money to its exemplary teachers. A “performance-based wage system” was officially implemented in 2009 to augment teachers' standard salary. The goals were first to motivate teachers to improve their performance and enhance the quality of the overall teaching pool, and second to raise teachers' income.

The second goal is particularly important because it improves recruitment and retention of teachers and raises the respect society affords them. Municipal guidance to districts specifies that the average wage of compulsory education teachers may be no less than the average wage of civil servants.

Studies suggest that the performance-based wage program has narrowed the income gap between teachers in urban and rural areas, thereby improving recruitment rates for rural areas and balancing the allocation of teaching staff (Draft of the 13th Five-year Plan for the Teaching Staff Construction of Basic Education). Still, school principals and

excellent teachers have told municipal authorities that the wage increase is not big enough, so Shanghai plans to allocate additional funds for teachers over the next five years.

Teachers' wages now consist of two parts: the basic wage and a performance-based wage. The basic wage, accounting for 70 percent of the total, is decided by both economic factors such as the cost of living and China's economic outlook, and personal factors such as a teacher's years of experience and responsibilities. The basic wage is divided into a "teaching post stipend" and a "workload stipend." The post stipend depends on the years of experience and responsibilities, as determined by the teacher's position on the career ladder. The "workload stipend" varies by the number of teaching hours, the concrete workload and the extra duties of the different posts.

School leaders design criteria for earning the performance-based wage, with approval by the Teachers' Union, and teachers are evaluated for it accordingly (Order No.54, Shanghai Municipal Education Commission, 2009).

Teaching Skills Contests

The government hosts teaching skills contests to raise teaching capacity, encourage teachers to improve and allow teachers to demonstrate their abilities and professionalism to the public.

The first teaching skills contest for young teachers in basic education was held at the Shanghai municipal level in 2015. Participants, all new teachers, presented their teaching skills by "designing teaching plans," "giving lessons" or demonstrating "professional skills" such as speaking, Chinese calligraphy, and Information and Communications Technology.

The Shanghai contest had three "outstanding" winners and 15 "first prize" winners. The Party Committee of the Education Commission and the municipal Education Commission gave outstanding winners the Labor Medal of Shanghai,

while first-prize winners received the title "Expert Teacher of Shanghai."

6. Summary

Teaching in Shanghai is promoted as a desirable and prestigious lifelong career, an occupation that requires professionals who hone their skills over the course of time. This means teachers must be retained for many years as part of a profession that values them and rewards them for taking on new responsibilities and challenges. For these reasons, in Shanghai the establishment and implementation of the teachers' professional title system and the principals' profession ranking system — known to a U.S. audience as "career ladders" — has greatly enhanced the quality of teachers' professional development and their standing in Chinese society.

In-service training is one of the basic requirements for promotion under this system, so professional development is conceived as an integral ongoing process of a teacher's life-long learning. In turn, teachers and principals at higher levels on the career ladders are required to undertake more demanding professional development. They must subject themselves to increasingly rigorous evaluation processes, and the system must be able to evaluate their capacities in progressively more systematic ways. These requirements determine the structure of the whole education system. Establishing career ladders for teachers and principals accelerates their professional development, but also determines the formation and improvement of related systems such as professional standards and performance evaluations.

The major contributions of the system can be summarized as follows:

- The teachers' career ladder is a driving force behind their continuous professional development.
- Teachers are encouraged to seek promotion along the professional ladders through becoming more expert in research on

teaching, thereby improving the profession's research competence.

- Teachers' progress up the career ladder has become aligned with evaluations of the professional development they complete. Policymakers in Shanghai have begun to consider whether teachers' professional development, including the number of learning credits they obtain, should be a component of their yearly performance evaluation.
- Teachers' and principals' career ladders align with the performance-based wage system. The career ladders make differentiated evaluation possible for each teacher and each function, with the result that teachers' wages are highly individualized.
- Principles of the performance-based wage system seek to illustrate the maxim "good work deserves good pay," placing great emphasis on rewarding and encouraging first-line teachers, leading (suburban area) teachers and teachers who contribute to alleviating the effects of poverty. This emphasis helps narrow the income gap between urban and rural areas.
- The career ladder balances the allocation of teaching staff. Principals are encouraged to transfer among different schools as a precondition of moving up the ladder, thereby ensuring that every school benefits from an infusion of different perspectives and unique talent. Teachers seeking advancement are encouraged to seek placement in rural areas or less-developed regions, and such teachers are given preference over their counterparts when they apply for higher professional titles. "Leading teachers," those willing to teach in suburban areas, can postpone their retirement by three or five years, an enormous incentive in China, where people often wish to work beyond the mandatory retirement age.

- Making awards to exemplary teachers is a critical component of this system, since it elevates the profession and helps teachers feel honored and supported.

7. Challenges for the Future

While PISA assessments show impressive results for students in Shanghai, they also identify areas for improvement. In the 2009 assessment, the total amount of time Shanghai students reported that they spent on learning out of school per week ranked first among 65 participating countries and regions. This means that students in Shanghai are heavily burdened with studying (OECD PISA Program, Shanghai-China PISA Research Team, 2010).

In addition, research on students' ability to innovate found that only about 30 percent of primary school students consider themselves creative. To make matters worse, this self-reported ability in innovation wanes with age (The Drafting Group of the Shanghai Medium- and Long-Term Program for Education Reform and Development, 2012: 74). This finding does not fit the blueprint of a city making efforts to transform its economic structure and to become an international innovation center.

Education reform in Shanghai now focuses on creating innovative, creative, life-long learners. This refocus is called "quality-oriented education" and has four principles: high quality, diversity, innovation and choice (Shanghai Municipal Education Commission, 2010).

Recent reforms have included adding time for individualized learning and class electives. Schools are now allowed and encouraged to develop curriculum for elective classes to expand student options and enrich their learning experiences. Digital learning environment and e-book packages are under experimentation as mechanisms to enrich students' learning materials and learning paths. Visits to public cultural facilities such as museums and science and technology halls provide students with out-of-school learning opportunities.

Teachers are key to the implementation of these reforms. New methods of teaching innovation and creativity will require new learning for teachers,

and Shanghai's system of continuous improvement and learning for teachers will be more important than ever.

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