ZHANG Minxuan, KONG Lingshuai

An Exploration of Reasons for Shanghai's Success in the OECD Program for International Student Assessment (PISA) 2009

Abstract The outstanding performance of Shanghai students in the 4th Programme for International Student Assessment (PISA 2009) gained widespread attention at home and abroad. In this paper, the authors attribute this outstanding performance to three traditional factors and six modern factors. The traditional factors are high parental expectations, belief in the power of effort, and the mechanisms of personnel selection. The modern factors are the openness of Chinese education, curriculum and teaching reform, teacher training, improvement of comparatively poor schools, the financial resources allocation mechanism in compulsory education, and the reform of high school enrollment.

Keywords Shanghai education, Program for International Student Assessment (PISA), traditional factors, modern factors

Introduction

On December 7, 2010, the Organization for Economic Co-operation and Development (OECD) formally announced its results of the 4th Program for International Student Assessment (PISA 2009), in Doha, Qatar. Chinese pupils from Shanghai far outscored their international peers in all three test fields—reading, mathematics and science—with the smallest gaps between highest and lowest scores within the assessment group and the smallest inter-regional and inter-school differences. With 65 participating countries and

ZHANG Minxuan
Shanghai Normal University, Shanghai 200234, China
E-mail: mxzhang@shnu.edu.cn

KONG Lingshuai (✉)
College of Education, Shanghai Normal University, Shanghai 200234, China
E-mail: konglingshuai@shnu.edu.cn

regions, this was the first time China had taken part in PISA¹.

The Shanghai students' performance produced a strong public reaction by domestic and international scholars and journalists. Angel Gurria, Secretary-General of the OECD, wrote in the preface of *PISA 2009 Results* that "the stunning success of Shanghai-China, which tops every league table in this assessment by a clear margin, shows what can be achieved with moderate economic resources and in a diverse social context ... Overall, PISA shows that an image of a world divided neatly into rich and well-educated countries and poor and badly-educated countries is out of date" (OECD, 2010, p. 5).

"This is an absolute wake-up call for America. The results are extraordinarily challenging to us and we have to deal with the brutal truth," U.S. Secretary of Education Arne Duncan exclaimed. *TIME* wrote that Shanghai's young students far outscored their peers in other countries in all three tested subjects. *Kyodo News* of Japan reported that although students in Shanghai were participating in the PISA project for the first time, they ranked first place in three subjects, putting the Chinese educational model in the spotlight. *Agence France-Presse* reported that youngsters in Shanghai had the best education in the world (Lu & Zhu, 2011).

Media and scholars in China have looked at the test results from various angles. On February 18, 2011, *China Education Daily* published an article entitled "From 'Shanghai experience' to 'global fortune': Examining the high-quality and balanced development of basic education in Shanghai in light of PISA results," introducing the experience of balanced development in Shanghai's basic education, and holding the view that the balanced development of basic education in Shanghai was a important factor in enabling students to champion in PISA, and this should be made known to the rest of the world (Shen, 2011, February 18). On February 26, 2011, the 21st Century Education Research Institute held a forum in Beijing on "Shanghai as PISA champion." Experts concluded that Shanghai's success in PISA did not necessarily equate to a success of the Chinese model, that balanced development of education was not impossible, and that reform would help shape the development of education (Xie, 2011, March 4).

Although scholars and media have made a number of interpretations of PISA 2009, they did not systematically summarize reasons for Shanghai's leading position. Even now, there is no clear conclusion as to why Shanghai performed so well. In response to the need for an explanation, the authors propose a

¹ PISA is an international student assessment project aiming at examining, once every three years, the learning ability of students who are receiving compulsory education. According to the requirements of OECD, after rigorous sampling, 152 schools in Shanghai and 5,115 fifteen-year-old school students represented 10 million students from various schools in the city to take the test for the first time in 2009.

combination of traditional and modern factors, closely related to Chinese history and culture. The three traditional factors chosen include high parental expectations, students' belief in the power of effort, and China's personnel selection mechanism. The six modern factors are: the openness of Chinese education, curriculum and teaching reform, teacher training, improvement of comparatively poor schools, financial resources allocation mechanism in compulsory education, and reform of high school enrollment. The authors believe that these factors have had a profound impact on basic education in Shanghai, and have contributed to the outstanding performance of students from Shanghai in the 2009 PISA project.

Traditional Factors

With over five thousand years of history, Chinese society has always strongly valued education and learning. Chinese parents have always consistently held high expectations for their children's education while children have likewise generally believed that knowledge can change fate and improve quality of life. While Shanghai is a modern city, its inhabitants still attach great importance to China's cultural heritage. Parents and students in Shanghai share traditional expectations and beliefs with people in other parts of China.

High Parental Expectations for Education

It has been said that parents in China tire themselves out for their children's education. All parents in China, no matter if they are from Shanghai or rural area, no matter their profession or wealth, have high long-term expectations for their children's education. Common idioms express the hope that one's child will become somebody, namely "long to see one's son or daughter succeed in life." (*wang zi cheng long* or *wang nii cheng feng*) Such long-term educational expectations are passed down from generation to generation via legends, stories and sayings, have and become an integral part of Chinese culture.

Long-Term Educational Expectations

Expectations include the inner hopes that people have for the future and prospects for development based on past experience and one's current situation. Parental expectations for education include hopes for their children's growth and development and the achievement of their objectives. Throughout the history, Chinese parents have had high expectations for their children. The famous story of "Mencius's mother moved three times (*Mengmu san qian*)" is a typical example, referring to the importance of finding the proper environment for

raising children. Liu, Wang, Liu, and Han (2009) made an investigation of the educational expectations of 550 rural households in Shangyi County, Hebei Province, and found that the proportion of households that hoped their children would receive higher education was close to 80%. Zhang's survey of 4,491 parents showed that 33.3% of interviewees wanted their children to attain doctoral degrees, 20.9% postgraduate degrees and 32.6% college degrees. In addition, parents who had themselves only gained secondary school education were especially keen for their children to become graduates. According to the survey, parents with lower levels of education expected their children to complete primary degree courses, and parents with bachelor's degrees or higher tended to expect their children to obtain a master's degree at the very minimum (Zhang, 2007).

Generally speaking, Chinese parents' expectations for their children to improve their social status, education, and income level result in a focus on superior universities and occupations. Parents expect their children to learn diligently and perform well in examinations. Providing the essential support structure needed for children to learn, they urge their children to do their homework, spending time to instill in them the importance of education. Studies by domestic and foreign scholars in recent decades have found that parents' expectations and children's overall level of educational achievement are positively correlated, due to parental engagement in their children's educational activities in which expectations are conveyed. Parents show this care and sense of ambition on a daily basis, and students learn that they cannot live up to their parents' expectations unless they work hard. That is, if parents lay a strong emphasis on academic progress, children will be incentivized to study hard to gain their parents' attention, respect and praise. In a survey on the learning objectives of only children, 64.5% declared their objectives were "to meet the expectations of my parents" (Song, Cai, & Yang, 2003, p. 155). Some scholars made a more systematic study of the influence of parental expectations and students' self-expectations on their academic achievements based on data from a large-scale survey of rural primary students in western China. The results show that parental expectation and students' self-expectation significantly affected academic performance, and that parental expectations have a major impact on students' self-expectation (Hu & Yang, 2010).

In short, high parental expectation is a widespread social phenomenon under the influence of thousands of years of historical and cultural traditions. This paper shows that as long as parental educational expectations are positive, they will have a helpful impact on their children's education.

The "American Dream" and Chinese Expectations

The American dream is the ideal of a better life that people believe they can

obtain as long as they work hard. This path to success is deemed accessible to those who have courage, creativity and determination rather than rely on others. The American dream represents the economic and entrepreneurial spirit of the original European immigrants to North America. Although some people critique the emphasis on the role of material wealth in happiness and victory, the concept of success by personal effort is not universally important. With limited governmental involvement, people in the U.S. have considerable economic freedom, and enjoy greater social mobility. Depending on talent and efforts rather than family background, the law protects equal rights and freedom of conscience. What is the real driving force behind the American dream? Some believe that it is the desire for and pursuit of wealth, a consistent element of the dream.

Chinese ambitions are different in that they have traditionally come true through learning in order to secure an official position. With such expectations, one prefers a “white collar” to a “blue collar” job, due to values such as “those who labor with their minds govern others, while those who labor with their strength are govern by others (*Laoxin zhe zhi ren, laolizhe zhi yu ren*)” (Mencius, 2009, p. 56). Generally, Confucian educational thought is the mainstream of educational thinking in China. The purpose of Confucian education is to develop the skills required by the ruling class. Confucius said: “in learning, one may receive an official salary (*Xue ye, lu zai qizhong yi*)” (Wang, 2011, p. 63). Zi Xia, a student of Confucius also said: “He who excels in study can follow an official career (*Shi er you ze xue, xue er you ze shi*)” (Wang, 2011, p. 64). Traditional concepts such as these are deep-rooted in modern China, and continue to affect the Chinese mindset.

Originating in the Tang Dynasty, the emperor selected government officials through the imperial examination. This method added societal weight to the concept of “learning well to secure an official position.” Rulers encouraged the popularity of civil service examinations. Zhao Heng, Emperor Zhen of the Song Dynasty, wrote a well-known “Urge to study poem” (*Quan xue shi*):

To be wealthy you need not purchase fertile fields,
Thousands of tons of corn are to be found in the books.
To build a house you need not to set up high beams,
Golden mansions are to be found in the books.
To find a wife you need not worry about not having good matchmakers,
Maidens as beautiful as jade are to be found in the books.
To travel you need not worry about not having servants and attendants,
Large entourages of horses and carriages are to be found in the books.
When a man wishes to fulfill the ambition of his life,
He only needs to diligently study the six classics by the window. (Guo, 1994, as cited in Yu, 2010, p. 46)

The message revealed in this poem is that the path to a good life lies in reading and obtaining fame. It is also said that only reading could glorify and bring honor to one's ancestors. Such life goals as "official rank pursuing surmounts all other occupation," "a hoary head does research in the classics; an aged person still learns," "to ordain conscience on heaven and earth, to secure life and fortune for the people, to continue lost teachings of past ages, to establish peace for all future generations" were assiduously sought and cited as honors by the intellectual class.

Although these views are somewhat outdated, they are still popular in China, affecting educational ideas, and the day to day activities of parents and students.

Examples of Parental Expectation

If parents have positive expectations of their children for education, children will compare themselves with the image their parents have of them and adjust their learning and life goals in the direction of these wishes. This paper cites two stories of Mencius, one of China's famous sages, and an important educator and thinker, to show the influence of earnest parental expectations and patient teaching on children's growth.

Mencius's mother moved three times (*Mengmu san qian*)

The story goes that Mencius's mother, a young widow left to raise her son, changed their residence three times. They first lived next to a cemetery, but she was not pleased to see her son mimic the actions of those performing funeral rituals. So she moved near a market, but then was not wholly satisfied when young Mencius would imitate the actions and words of those hawking goods. Determined to find the best possible environment for her son, she moved a third time, settling down and finding contentment near a school, where her son intoned the lessons of teachers and followed their example of diligent study. (Mencius, 2009, p. xviii-xix)

Mencius's mother cut the fabric (*duan ji jiao zi*)

Each day, upon his return from the school, his mother asked Mencius what he has learned. One day, when he answered casually and with no substance, she cut the woven cloth she was weaving, thereby ruining it. Mencius was shocked since his mother's weaving was their source of income and he did not know why she would waste it. She explained that his waste of a day of learning was as bad as her wasting a day of work. (Littlejohn, 2011, p. 46)

Students' Belief in the Power of Effort

Chinese students are known to be hard working, believing that diligence can make up for any shortfalls in intelligence, change fate, and improve quality of

life. Chinese students are regularly told fables about education by their parents and teachers. When Chinese parents and teachers introduce Thomas Edison, the American inventor, they always remind students of Edison's words: "Genius is one percent inspiration and ninety-nine percent perspiration."

No Essential Distinction between People

From the foundation of the People's Republic of China in 1949, "Marxism and Mao Zedong Thought" became the guiding ideology of China. In his writings, Mao Zedong followed Karl Marx in stressing the lack of distinction between people. Marx once wrote:

The difference of natural talents in different men is, in reality, much less than we are aware of; and the very different genius which appears to distinguish men of different professions, when grown up to maturity, is not upon many occasions so much the cause, as the effect of the division of labor. The difference between the most dissimilar characters, between a philosopher and a common street porter, for example, seems to arise not so much from nature, as from habit, custom, and education. (Wood, 1998, p. 138)

Mao Zedong, who advocated labor and equality, said, "The lowly are the most intelligent; the elite are quite ignorant" (Barmé, 1996). Compared with parents and students in India, Chinese parents and students have a deeper understanding of the role of nurture in human development. "Chinese and Indian parents vary in their beliefs about the malleability of development. Although Chinese and Indian thought both accept individual differences as innate endowments, the Chinese believe that these differences can be overcome through effort. Indians also recognize the value of effort, but can be more accepting of individual differences because they believe that predetermined tendencies limit development" (Rao, Cheng, & Narain, 2003, p. 166). The "idea that the lower castes are not deserving of education is so deeply rooted among members of the Indian middle class that it has hampered the universalisation of primary education" (p. 168). There is a residual sense that education will disrupt the social order if promoted among lower castes. Therefore, parents and students in India avoid pushing themselves beyond their societal bounds. This does not mean that Indian parents and students do not respect the spirit of endeavor, but that they tend to accept individual talent differences in learning ability (Rao, Cheng, & Narain, 2003). By contrast, Chinese parents and students are more inclined to think that there is no essential distinction among people in terms of natural talents which cannot be made up through acquired learning.

Belief in Success through Hard Work

Education has a social mobility function, meaning that members of society can transform, adjust and change in different social areas, social levels, occupational status and bureaucratic organizations through cultivation, screening, and improvement of education to give full play to their individual strengths, show their wisdom, and achieve their aspirations (Wang, 2011, p. 65). People's educational background, ability and personality can be modified, with new conditions and possibilities generated. Applicable to all social classes, education is a means of mobilizing upwards in society. In modern society, such social mobility via education has become increasingly important. The educational function of social mobility continues to be strengthened, encouraging members of society to make consistent progress, not only guided by the full and free development of individual quality but also affected by local or global changes in the social structure.

Education in China has played a certain role in social mobility ever since ancient times through shifts from official learning to private education, from the recommendatory system and ninth-class official system to the civil service examination system. Since the Sui and Tang Dynasties, many scholars have regarded "persevering for 10 years of studies in spite of hardships," to have their names "published on the list of successful candidates" as a difficult yet enticing approach to securing an official position and a promotion from being "a farmer in the morning" to becoming "an official beside the emperor by afternoon." Even today, the majority of the Chinese people still believe that they can change their destiny and enhance the quality of life by studying hard. Under the influence of mainstream views and typical events, Chinese students study extremely hard. They believe that they are likely to succeed if they study hard. Therefore, although Chinese students have to spend a long time studying, they accept the necessity of doing so. A related survey found that, of 4,491 valid samples, over 50% thought that personal effort, education and family background were the most important elements to affect people's fate (Zhang, 2007). This indicates that the Chinese ideal of social status change and social mobility are deeply influenced by these aspects. In addition, this reflects the fact that social mobility in China is relatively smooth from other aspects, and is generally fair. As China's education-based social mobility function is smooth, many people have succeeded in achieving upward mobility through their own efforts, so students (especially disadvantaged students) have a very strong motivation for learning.

Examples of Learning That Changes Fate in China

There are many global examples of how learning can change fate. In China, these

cases are promoted in the classroom, and have a strong impact on parents and students alike. The following representative stories illustrate Chinese recognition and appreciation of the concept of studying hard.

Tying one's hair from a beam (*tou xuan liang*)

Sun Jing, before establishing himself as a learned scholar of the Western Han Dynasty, invented another way to keep himself awake while reading books during the night. He tied his hair to an overhead beam, so whenever he began to fall asleep, the painful yank of his hair invariably woke him up. (Zhang, 1996, p. 174)

Pricking one's thigh with an awl (*zhui ci gu*)

Su's [a famous strategist during the Warring States Period] career as a strategist started with a total failure. He first went to serve the king of Qin, then a great power among seven ducal states which were fiercely vying with each other for hegemony in today's northern, eastern and central China. But the king had never accepted any of Su's ideas or proposals on how to conquer the other states. Broken and depressed, Su retreated to his home in Luoyang, where he was ridiculed by his kinsmen and joked about even by his wife and sister-in-law. Su blamed his failure on his lack of knowledge of strategy and a thorough understanding of current affairs. Therefore, he decided to spend more time studying classical strategy. Day and night, Su buried himself in books. Whenever he was too tired, he used an awl to prick his thigh to keep himself awake. More than 12 months later, the young strategist felt that he was well prepared and then set off for a new mission, this time to help the other six states to fight Qin. (Zhang, 1996, p. 174)

Digging a hole on the wall to borrow the neighbor's light (*zao bi tou guang*)

Kuang Heng, a famous essayist during the Ming Dynasty, was very poor in his childhood. His family could not afford light. To study, he chiseled a hole in the wall to borrow the neighbor's light. Later he became a prime minister. (Lau, Hui, & Ng, 2004, p. 94)

The Traditional Personnel Selection Mechanism

Parents in China have high expectations for their children, who personify their hopes for the next generation. Students in China believe that there is no difference between people and they can succeed and change their fate as long as they make an effort. These ideas are closely related to the personnel selection mechanism which makes the upward mobility possible for people in the lower ranks of society. This also has a profound impact on parents' expectations for education and Shanghai students' belief in education.

The Imperial Examination System

The imperial examination system was established in feudal times as a method of

selecting government officials. It is called the *keju* examination, meaning the selection of officials by separate subjects (where *ke* means subject and *ju* means selection). Since the Wei-Jin period, the nine-rank system was chosen, and officials were mostly the children of government officials' families. To change this, Emperor Yang of the Sui Dynasty formally designated success in the highest imperial examination as the method of selecting talented people. 605 AD marked the birth of China's imperial examination system. The system lasted 1,300 years until the 31st year of the Qing Dynasty, 1905 AD.

The original purpose of the imperial examination was to select talented people for government and break of the power of the hereditary nobility, thus rectifying a broken system. Compared with hereditary, recommendatory and other selection systems, the imperial examination was clearly a more equitable and transparent way to improve personnel selection. Hu Shih, Chinese philosopher, considered the imperial examination system one of the historical foundations of modern China. He said:

This system is really objective and fair, if students are frustrated in the examination hall, they rarely complain about the unfair examination system. It is a fair system, even the boy from the most humble family can climb to the most glorious and powerful position in the empire through the normal competitive process. Through the long-term training of the system, deep-rooted concept was formed in the hearts of Chinese: The government should be mastered by the people with the most competent governance; government officials did not inherently belong to a particular class, and an open competitive examination system for those who intended to participate in the exam should be selected. (Liu, 2005, p. 6)

When the imperial examination system in the Sui and Tang Dynasties gradually replaced the system of familial power and influence of the Wei and Jin Dynasties, China became one of the first countries in the world to offer scholarships based on intellect, and set aside the family background qualifier. There were at least two advantages of this new system. First, it broadened the basis of selecting talented people by the government. The imperial examination system has explored and developed many talents for the past dynasties in China in the past 1,300 years. Nearly 100,000 candidates to the highest imperial examinations were generated, and several million candidates in the imperial examination at provincial and county level were selected. Such national heroes from Lin Zexu to Wen Tianxiang, writers from Bai Juyi, Liu Zongyuan, Liu Yuxi to Ouyang Xiu, Su Shi to Xin Qiji, politicians from Wang Anshi, Bao Zheng to Hai Rui and Zhang Juzheng, educators from Han Yu, Zhu Xi to Cai Yuanpei, Huang Yan, even scientists such as Shen Kuo, Song Yingxing, and Xu Guangqi, were all discovered through the examination system. Secondly, it gave intellectuals the opportunity to move up in society, as many common expressions

attest: “Pines should be planted if the mountain is thin, also children should receive education if the family is poor (*Shan shou zai songbai, jia pin zi du shu*).” “A farmer in the morning can be an official beside the emperor by afternoon (*Zhao wei tianshe lang, mu deng tianzi tang*).”

In addition, the imperial examination system played a significant role in maintaining the stability of society as a whole, playing an advocating role in popularizing a learning atmosphere among the people. However, the imperial examination system also caused some adverse effects. The content was considered too rigid and limiting to capture all talent.

The Examination System

Although the imperial examination system was abolished in 1905, the examination method was here to stay, with western countries learning from the imperial examination system in terms of their own official selection methods. Both National Colleges Entrance Examination and civil service examination system in China go back to the imperial examination system in form to some extent. They have inherited competition, the spirit of equality and meritocratic principle of personnel recruitment.

Two systems for selecting talented people have always co-existed in China: recommendation and examination. The recommendation system combined with the performance and grades of candidates resulted in the selection of students of fine qualities and scholarship. However, the Chinese always take into consideration “justice, law and human bonds” when they act while human bonds and relationships play an important role in social life, and even there are phenomena of “human bonds and relationships as more important than justice” and “more important than law.” In the process of selecting talented people, human bonds and relationships could not be ignored, and those selected gradually turned into cliques to promote selfish interests. “Recommendation” at the time of the Cultural Revolution was synonymous with “pulling strings,” and now the students admitted by recommendation to colleges and universities in some areas turn out to be “the good rather than the excellent” and “officials rather than ordinary people” (Liu, 2000, p. 42). The practice proved that the recommendation system brought with it a high level of interference by human factors, which led to a fudging of ability and performance.

To get out of the dilemma of balancing human bonds and the selection of talents objectively and fairly, examinations were established to regulate and safeguard social equality and social order. Because of the selection of personnel examinations, all candidates received the same challenges and abilities; the learning of individuals was placed in first place so as to break down nepotistic practices and remove the interference of human bonds. Examinations have

always been considered an objective and fair approach for the selection of talented personnel. While class difference and the social ladder have always been important in ancient times, China was able to see the advantage of examinations for fair competition and the pursuit of equality, impartiality and openness in the personnel selection system.

The National College Entrance Examination in Modern Times

Even now, some elements of the imperial examination can be seen at work in China, in the National College Entrance Examination. Some common practices from the imperial examination are still carried out; for example, provincial based enrollment, disguising candidates' identity when grading to prevent preferential scoring, and regarding the student with the highest marks as the national champion of the year. Indeed, the modern National College Entrance Examination and the ancient imperial examination have much in common. First, both seek out talented people through public competitive selective examinations that take test scores as a basis for choice, remove personal bias and ensure that everyone is equal before the score. Second, they are the national exams under government control. Third, the two tests have rigorous examination processes. Finally, there are similarities between the two in terms of the role and influence of the examination. It can be said they are both "double-edged swords."

However, there are some differences between the National College Entrance Examination and the earlier imperial examination. First, the purpose of the examination has altered. While the imperial examination had an educational nature in the ancient higher education system, it was a civil official examination in the first place (martial examination is not considered here). The purpose of the imperial examination was to select political talent for the government. Therefore, the imperial examination system was both an educational and a personnel examination system. Passing the imperial examination to be an official was almost the only way to achieve one's ambitions at that time, while the chance of passing the imperial examination at the provincial level was very small for an individual. The National College Entrance Examination is the entrance examination system to admit undergraduates to university, those who pass have no other political status, and the acceptance rate is much higher than the imperial examination, while the ways to becoming a talented person in modern society are broader than in ancient times. The National College Entrance Examination may be the best path but it is not the only path for high school students. Second, due to different purposes of examination, there are significant differences between the National College Entrance Examination and the imperial examination in terms of examination content and application conditions. Third, there are many differences in the kinds of questions, testing, scoring and marking methods.

Fourth, the imperial examination played a far more important socio-political role and its influence on the educational structure was more significant than the National College Entrance Examination (Liu, 2000).

Idioms Derived from the Imperial Examination

The imperial examination has not only influenced China's socio-political and educational structure, but also had a deep impact on the Chinese psychology and mindset. It also has generated familiar expressions, such as passing the examination (*jinbang ti ming* 金榜题名), winning the first places in three examinations in a row (*lian zhong sanyuan* 连中三元), “falling behind Sun Shan” on the list (*mingluo sunshan* 名落孙山), passing an imperial examination with the highest score (*zhuangyuan jidi* 状元及第), failing the civil examination again and again (*baila mingjing* 白蜡明经), “plucking cinnamon flowers in the Palace of the Moon,” (*changong zhe gui* 蟾宫折桂) becoming a favorite pupil of a great man (*deyi mensheng* 得意门生), “to take the first place at the triennial palace examination,” (*du zhan ao tou* 独占鳌头) being very rich and honorable, being ranked first class in the palace examination (*gao bu tong qu* 高步通衢), enlisting talents through the old civil service examination system (*jidi cheng ming* 及第成名), selecting officials through imperial examinations (*kai ke qu shi* 开科取士), becoming friends through the imperial examination (*nianyi shihao* 年谊世好), studying 10 years in spite of hardships and becoming famous overnight after the imperial examination (*shi nian hanchuang, yi ju cheng ming* 十年寒窗一举成名), etc. Two well known idioms derived from the imperial examination are listed below:

Jinbang timing

The Palace Examination was the final stage in the sequence of civil service recruitment examinations during the Qing Dynasty (1644–1911). This examination was prepared and presided over by the Emperor in person. The Golden List showed the names of successful candidates and were written on a sheet of yellow paper (...) In the Qing Dynasty, the regularly scheduled civil service recruitment examination was the only way for scholars to seek official positions. The sequence of the examination includes District Examination, Provincial Examination, Metropolitan Examination and the Palace Examination, which was held in the Hall of Preserving Harmony in the royal palace. Those who passed (...) would be selected in three categories and the name lists would be made public on a sheet of yellow paper, which is called Golden List or Yellow List. There were two types of Golden Lists. The small one would be submitted to the Emperor, and the large one put outside the Chang' an Gates (...) The paper starts with an imperial command and follows with the name lists of the passers of the three categories. (UNESCO, 2005, p. 1)

This idiom later came to refer to those admitted to an institution following

success in examination.

Lian zhong sanyuan

The number one scholar in the rural exam is called a *Jieyuan*; the number one scholar in the capital is called a *Huiyuan*; and the number one scholar in the final imperial examination, presided over by the emperor is called a *Zhuangyuan*. If a scholar passes as number one in all three examinations he is called a *lian zhong sanyuan*. There is an expression sometimes used to wish a potential candidate good luck, and to suggest that he is going to be top in all three exams. (Bates, 2007, p. 7)

Modern Factors

China has undergone enormous societal changes since the reform and opening up period began 30 years ago, not least in the field of education. Shanghai has been at the vanguard of this reform process, not least in terms of education reforms. Besides the above-mentioned three traditional factors, the outstanding performance Shanghai achieved in PISA 2009 is closely related to the following modern elements: the openness of China's education system, curriculum and teaching reform, on-the-job teacher training, improvement of comparatively poor schools, teacher training, special allocation mechanism of financial resources of compulsory education and reform of high school enrollment in Shanghai. Although teachers' training, improvement of comparatively poor schools, special allocation mechanism of financial resources of compulsory education and reform of high school enrollment in Shanghai were implemented from 2006 to 2007 in succession, the authors believe that the reason Shanghai had such outstanding performance in PISA is mainly attributed to long-term education reform, with recent reforms often following on from previous reforms. By and large, the two stages of reforms, before and after 2007, have indeed greatly contributed to the balanced development and quality improvements in Shanghai's basic education system.

Openness of the Chinese Education System

The Chinese education system has maintained a flexible and open attitude to new foreign educational theories, ideas and methods. Education administrators have been engaged in learning from the advanced experience of developed countries, assisting front-line teachers absorb such theories into practice. In China, university professors and school teachers are well acquainted with leading foreign educationists and their theories. As one of world's major metropolises, Shanghai is very much concerned about foreign educational theories and educational information, and teachers in Shanghai have learnt to grasp foreign

educational theories pretty thoroughly.

International Educational Exchange

Chinese scholars, teachers and students have been sent abroad to visit, study and engage in advanced studies since the start of the reform and opening up period. China has trained a large number of young scholars with high academic credentials and proficient foreign language skills, many of whom have over 30 years experience of studying and working abroad. Their research has provided much international experience for the reform and development of Chinese education. Meanwhile, Chinese education has actively integrated itself into the world education system. In recent years, exchange opportunities, joint research projects and international student dialogues have seen huge growth.

In addition, the number of foreign experts working in the Chinese education sector has also increased, and with this, advice and suggestions for China's educational development have accumulated. In early 1980, the Ministry of Education invited Professor Hu Changdu, an American-Chinese scholar at Columbia University, to lecture in the Department of Education of Beijing Normal University. Beside comparative education lectures offered to students, Professor Hu delivered lectures on methodologies of comparative studies of education to the training class organized by the ministry, which consisted of more than 10 teachers from 10 universities (Gu, Kan, & Qiao, 2008, December 30). Edmund King, Philip Coombs and other renowned international scholars in education also lectured on educational issues while on visits to China. Meanwhile, a large number of foreign teachers now teach in universities and schools in China, strengthening international teaching exchange.

Introduction of Overseas Educational Theories

Many educational theories, ideas and methods from the developed world have been introduced into China since reform and opening up started. "We know the well-known experts in the United States, Britain, Japan and other countries and what is new in their ideas and theories on contemporary education; sometimes we even know them better than people from their own country" (Zhang, as cited in Ma, 2010, December 20). Table 1 lists foreign educators who have influenced education in Shanghai and other parts of China in recent years.

In addition, five major journals on foreign education have been founded in China since 1980, advancing China's depth of knowledge: *Comparative Education Review* issued by Center for Education Research at Beijing Normal University, *Global Education* by the Institute of Curriculum and Instruction (ICI) of East China Normal University, *Foreign Education Research* by the Institute of

Foreign Education of Northeast Normal University, *Elementary and Secondary Schooling Abroad* by Shanghai Normal University and *World Education Information* by the Education Management and Information Center (EMIC) of the Ministry of Education. These journals have had a great influence on the field, with each gaining a yearly circulation of over 10 thousand copies. They play an important and guiding role in educational reform and practice in Shanghai and across China.

Table 1 Foreign Educators who Influenced Education in China

Educator	Nationality	Main concepts	Field of study
John Dewey	The United States	Learning from practice	Democracy and education
Jerome Bruner	The United States	Discovery teaching	The process of education
Benjamin Bloom	The United States	Mastering teaching	Taxonomy of educational objectives
Howard Gardner	The United States	Multiple intelligences theory	Frames of mind: The theory of multiple intelligences
Andrey Markov	Former Soviet Union	General development	Teaching and development
Jurij Babanski	Former Soviet Union	Optimization of teaching	Optimization in teaching process from the aspect of general teaching theory
Vasyl Sukhomlynsky	Former Soviet Union	Harmonious teaching	One hundred suggestions to teachers
Johnson O'Connor	United States	Analytical philosophy of education	An introduction to philosophy of education
Martin Wagenschein	Germany	Model teaching method	Understanding learning
Sato Manabu	Japan	Transform classroom learning approach	Quiet revolution
Michael Fullan	Canada	Education reform theory	Change forces: Probing the depths of educational reform
Maria Montessori	Italy	Teaching method	Montessori teaching method

Teachers Equipped with Educational Theories

Teachers have been learning and practicing western theories, ideas and methods introduced into China from developed countries, with a resulting positive impact on teaching practice. Article VIII of *China's Regulations of Continuing Education of the Secondary and Primary School Teachers* states, "teacher training includes: ideological and political education and professional ethics training; updating and extending expertise; modern educational theory and practice; scientific research on education; training on teaching skills and modern educational technology; and modern technology and knowledge of humanities"

(Ding, 2010, p. 171). Modern educational theory and practice is clearly the key aspect of training. According to a survey by Ding (2010), teachers untrained in modern educational theory and practice account for only 5.3% of the 11,190 surveyed full-time teachers from various types of schools at all levels in nine provinces (municipalities and autonomous regions) (see Fig. 1).

Fig. 1 The Distribution of Untrained Teachers by Training Category

Source: Ding, G. (Ed.). (2010). 中国中小学教师专业发展状况调查与政策分析报告 [*Report of investigation and policy analysis of professional development of primary and secondary school teachers in China*]. 上海, 中国: 华东师范大学出版社 [Shanghai, China: East China Normal University Press], p. 173.

A majority of teachers in China have a good understanding of modern educational theories and apply them in the classroom. This has helped them change their basic conception of education, develop new teaching methods, and laid a foundation for further career development. Some teachers have become more research-focused and analytical, which has contributed greatly to quality.

Curriculum and Teaching Reform in Shanghai

Students and teachers in Shanghai reflect new features seen in the results of PISA 2009. Firstly, learning styles have changed, with students able to use more learning skills, including the skills of generalizing, comprehension and memory, self-regulation, memory and elaboration, instead of simply learning by rote. In aspects such as reading for pleasure, reading for enjoyment, and reading range, students in Shanghai scored significantly higher than those of OECD members countries. Students in Shanghai have significantly improved their ability to apply knowledge to everyday life. Secondly, teachers are equipped to use a variety of

classroom teaching methods. The PISA report shows Shanghai is above the OECD average in factors such as teacher-student relationship, discipline, and strategies to inspire students to read. As Tan Yibin, a researcher in a teaching and research group of the Shanghai Municipal Education Commission (SMEC) pointed out, it is a global misunderstanding that students in China learn by rote. Shanghai's classes continued to emphasize experience, enlightenment and application and oppose spoon-feeding teaching methods. In recent years, Shanghai has laid emphasis on assessing students' ability, not just testing students' textbook knowledge. Actually, the use of open-book examinations in some subjects has led students away from rote learning (Su, 2010, December, 19). *TIME* pointed out that the U.S. could learn from Shanghai and Hong Kong about how they abandoned their earlier focus of education for the elite, and education for the few, and how they improved teachers' wages and investment in training, reduced rote learning content and focused on carrying out a variety of problem-solving activities in the classroom (Su, 2010, December, 19). The PISA test exemplified the effectiveness of curricula and teaching reforms in Shanghai over the past 20 years.

Curriculum Reform

In order to adapt to new situations and cultivate inter-disciplinary talents, China has conducted large-scale curriculum reform since reform and opening up. The State Education Commission began to implement the "One Guide-Multiple Textbooks" policy to offer more choice of primary and secondary school textbooks, and this diversification of teaching materials was put into practice gradually in the late 1980s. Shanghai is a pioneer in education reform, while curriculum reform is the key. In May 1988, Shanghai established the "Curriculum and Teaching Material Reform Commission in Primary and Secondary Schools" to be responsible for the city's comprehensive reform on curriculum and teaching materials. This officially began the curriculum and teaching materials reform in primary and secondary schools.

After more than one year's research, Shanghai's curriculum and teaching material reform commission for primary and secondary schools developed a reform program. Comprehensive quality improvement was the core, and the starting point was the needs of society, the subject system and the development of students. The basic idea was to strengthen the foundations, cultivate capacity, improve quality, develop individuality, and strive to change the course structure of "enrollment into higher education," by adopting a new nine-year school system, strengthening moral education courses, adjusting the course structure and time allocation, controlling examinations and the amount of work, constructing

activity system and other innovative measures. Under the guidance of the program, new textbooks for primary and secondary schools were edited by experts organized by Shanghai government. After two years of reform, the new materials were fully employed in the first grades in stages starting from autumn 1993.

Based on the first phase of curriculum reform (1988–1998), Shanghai began developing the second phase of curriculum reform in 1998. The goal of the second phase of reform was to emphasize “innovation” and “practical ability.” The goal of the curriculum was to change the situation that students adapted to the course in the past, to establish a modern curriculum program to promote the development of each individual, to establish a system of three types of subjects (namely compulsory, elective and extra-curricular), to shift from two basics (basic knowledge and basic skills) to four basics (basic knowledge, basic skills, basic ability and basic attitude), to provide five kinds of learning experience for students (experience of moral formation and personal development, experience of potential development and cognitive development, sports and fitness experience, artistic culture and development experience, the experience of social practice) and to form eight learning areas and relevant subjects (language and literature, mathematics, natural science, social sciences, technology, arts, physical education, and a practicum; see Table 2).

Table 2 Characteristics of the Second Phase of Curriculum Reform in Shanghai

Training objective	To emphasize “innovation” and “practical ability”
Curriculum objective	To establish modern curriculum system that adapts and contributes to the development of every student
Three types of main curriculums	Compulsory curriculum Expansive curriculum Inquiry curriculum
Four basics	Basic knowledge Basic skills Basic ability Basic attitude
Five kinds of learning experience	Experience of moral formation and personal development Experience of potential development and cognitive development Sports and fitness experience Artistic culture and development experience Experience of social practice

(To be Continued)

(Continued)

Training objective	To emphasize “innovation” and “practical ability”
Eight learning fields	Language and literature
	Mathematics
	Natural science
	Social sciences
	Technology
	Arts
	Physical education
	Practicum

In order to carry out the reforms efficiently, organizations such as the teaching and research group of the SMEC implemented the following measures: writing a “program of action” for the reform of each subject, writing a “curriculum program” and “curriculum standards,” establishing the research base of class reform and promoting inquiry curriculum and school-based curriculum. All measures have helped progress the second phase of curriculum reforms considerably (Li, 2010, p. 190). Overall, the second phase of the reforms has had a significant impact on primary and secondary schools in Shanghai. First, the concept of focusing on “students’ development” has been strengthened. Second, classroom teaching activities had become more varied, with improved awareness and teaching capacity. Third, students’ academic quality, innovative spirit and practical skills saw overall improvement. Fourth, a mechanism of sustainable development and protection of various types of expert teams has been formed. Fifth, the guidance of the research team has been significantly enhanced (Curricular Review Committee of Primary and Secondary Schools [Nursery Schools] in Shanghai, 2011).

Teaching Reform

After the resumption of the National College Entrance Examination in 1977, Shanghai encouraged bottom-up educational reform. The “Experimental Reform of Mathematics Teaching in Qingpu County” was one of the most influential tests of reform education. In 1980, Gu Lingyuan organized and led a mathematics teaching experiment in Qingpu County in order to improve the quality of mathematics teaching in secondary schools. Through an investigation of teaching, experience screening, experimental research, promotion and application, Gu’s team summarized four kinds of basic teaching experience to help students study effectively; the first being to stimulate students’ interest in

learning by providing strong motivation; the second to re-organize teaching content and sequence; the third to improve teaching methodology by supplementing test activities in teaching; and the fourth to strengthen feedback to adjust instruction as needed. These measures are referred to as a “trial and adjustment by feedback” approach. With the success of the reform in mathematics, experimental reforms of other primary and secondary school subjects were trialed in Qingpu. The quality of education scaled up in the mid-1980s, reaching the middle and upper level of urban schools in Shanghai. The Shanghai Bureau of Education (the present Municipal Education Commission) and the State Education Commission promoted the success in Qingpu across the country between 1986 and 1992. In 1996, the experimental reforms in Qingpu were shared with an international mathematics education conference (Li, 2010, p. 136).

In the 1980s, schools in Shanghai carried out diversified overall experimental reforms in education with their own characteristics and features. In 1985, Jianqing Experimental School in Changning District launched a new school system of “2-5-4” comprising of a two-year nursery, five-year primary and four-year secondary education, while Liaoyang Secondary School and the primary school attached to it carried out a comprehensive experiment of a nine-year compulsory education, with five years of primary and four years of secondary school. In 1987, Liu Jinghai carried out a “successful education” reform in No. 8 Secondary School of Zhabei District, which started from a study of “students with learning difficulties,” finding that the essence of “failure is the mother of success.” After several attempts, Liu formed a successful education concept, defined as the “three believes”: that every child has the desire for success, that every child has the potential to succeed and that every child can succeed in many aspects (Li, 2010, p. 138). In the 1990s, Shanghai Experimental School adhered to the study of overall education reforms, proposing the experimental objective of “developing students’ intellectual potential, developing their individual strengths, guiding each student to gradually complete the growth process of self-discovery, self-learning, conscious performance in the 10-year learning process and realizing the domination of hidden potential.” The school continuously adjusted and improved the experimental plan according to results at each stage.

In short, curriculum and teaching reforms in Shanghai achieved great results and greatly improved the quality of basic education. In the first national curriculum reform teaching and research achievement evaluation, Shanghai won seven first prizes, four second prizes and 10 third prizes, and the number of the first prizes and the total number of prizes ranked first nationwide. The project of “Analysis of Quality, Feedback and Guidance System in Primary and Secondary Schools” launched by Ministry of Education shows that more than 99% of

Shanghai students' met the requirements of the national curriculum concerning Chinese and mathematics, 95% when English was included; inter-school difference were minimal (Shen, 2011, May).

On-the-Job Teacher Training in Shanghai

First-rate education needs first-rate teachers. China has a well honed system of on-the-job training for teachers, a unique teaching and research group, classroom group discussions and collective preparation of instruction system to carry out professional seminars, improve and advocate regular and systematic teachers' experience sharing. However, in the U.S. and Europe, teaching is more about teacher's personal behavior. Shanghai also attaches great importance to on-the-job teacher training and professional development in primary and secondary schools. There are five main forms of training.

Teaching and Research Group (TRG), Classroom Group (CG)

TRG and CG are distinctive organizational forms which have existed in primary and secondary schools for a long time. TRG takes discipline as the basic unit. Teachers of the same subject carrying out teaching and research activities are able to improve their teaching and teaching capabilities, and ultimately improve teaching quality. CG is a collection based on the students in the same grade and teacher, or teacher in charge of a class in the same grade. It is on the basic unit of the class to facilitate cooperation between teachers of various disciplines, strengthen the horizontal linkages among teachers, coordinate work content among teachers, co-manage students in the grade, and evaluate teachers' completion of tasks (Zhou, 2005).

Lesson planning (LP) is not only a task but also an important way to promote the professional development of teachers. TRG and CG play a role in LP capability and classroom teaching skills of teachers, and thus can contribute to the sustainable development of teachers' professional standards. According to research from Chinese scholars such as Ding (2010), TRG plays a major role in the collective preparation of instruction, which 74% of the teachers sometimes or often used. CG ranks second place, with 62% of teachers sometimes or often using it (see Fig. 2).

Classroom Observation and Classroom Evaluation

There are classroom observation and TRG classroom evaluation systems in school-based educational research on basic schools in Shanghai. TRG was started in order to provide teachers with better teaching quality, organize teachers with

Fig. 2 The Use Ratio of Teacher’s LP Form (%)

Source: Ding, G. (Ed.). (2010). 中国中小学教师专业发展状况调查与政策分析报告 [Report of investigation and policy analysis of professional development of primary and secondary school teachers in China]. 上海, 中国: 华东师范大学出版社 [Shanghai, China: East China Normal University Press], p. 194.

the same task, unify schedules, and collectively prepare instruction, so that every student attending a similar course would have approximately the same level. However, TRG found that some classes got good grades, while others had poor performance even with the same teaching content, the same lesson plans and processes. Was this because of how the students learnt or how the teacher taught? TRG started turning its attention to teacher teaching. First, the heads of TRG observed classroom teaching, then teachers in the same TRG observed and evaluated each other’s classes, and finally they carried out classroom observation and evaluation concentrating on a common problem. Classroom observation and evaluation became one of the main forms of school teaching and research. Besides classroom observation and evaluation in TRG, each school would open up university level courses, and teachers would evaluate each other’s teaching each semester.

Classroom observation and evaluation are important ways of improving teaching skills, and have become the main form of teacher training and professional development. Classroom observation and evaluation can help young teachers develop, and can stimulate reflection and innovation in more experienced teachers. According to research from Ding (2010), among the training of teachers and professional development activities in the survey, the majority were “teaching and research activities such as classroom observation and evaluation in their own school,” accounting for 37.9%; followed by “training and university lectures or other training sessions,” accounting for 19.8%; followed by “teaching and research activities such as classroom observation and evaluation in other schools,” accounting for 19.0% (see Fig. 3).

Fig. 3 Proportion of Various Types of Training and Professional Development Activities Teachers Participated in

Source: Ding, G. (Ed.). (2010). 中国中小学教师专业发展状况调查与政策分析报告 [*Report of investigation and policy analysis of professional development of primary and secondary school teachers in China*]. 上海, 中国: 华东师范大学出版社 [Shanghai, China: East China Normal University Press], p. 171.

Projects 240 and 540

Shanghai lays considerable emphasis on in-service training of teachers to promote learning and lifelong learning. On October 8, 2007, the Shanghai Education Commission issued the “Roadmap for Teachers Development in Shanghai Basic Education in Eleventh Five-Year-Plan.” The roadmap pointed out that during the 11th Five-Year period, teacher development in Shanghai basic education should adhere to “teacher development as an orientation and effective learning of teachers as a core.” It also suggested that during the Eleventh Five-Year period, all teachers’ implementation of continuing education center was in the school, and teachers in junior or senior positions should be required to complete 240 and 540 hours of training, of which more than 50% should be at college-level (Sun, 2010).

It is to this requirement that projects 240 and 540 refer. New graduate teachers were set a target of 240 hours of training in their first five years of teaching, while those who took 540 hours over five years could apply for senior professional titles. Project 240 and 540 provided Shanghai teachers with institutionalized training guarantees at teacher training colleges to enable new teachers to adapt to their new work and senior teachers’ to have the chance of professional development.

Teachers’ Research Activities

Since the implementation of the new curriculum reform, research has become a

required activity in primary and secondary schools. A survey of Ding Gang's team (2010) shows that of 11,190 teachers, a total of 87.6% were engaged in teaching and research activities once a week over the past two years, 54.4 % of whom participated in the activities one or more than one time every week, and only 2.3% of whom did not participate. It can be seen that the majority of teachers in schools participated in regular teaching and research activities organized by schools (see Table 3).

Table 3 Teachers' Participation in Routine Teaching and Research Activities

	Number of teachers	Percentage (%)
Never	262	2.3
Irregularly, seldom	381	3.4
Once per semester	359	3.2
Once every other month	387	3.5
Once per month	1,365	12.2
Once every other week	2,347	21.0
Once or more per week	6,089	54.4

Source: Ding, G. (Ed.). (2010). 中国中小学教师专业发展状况调查与政策分析报告 [*Report of investigation and policy analysis of professional development of primary and secondary school teachers in China*]. 上海, 中国: 华东师范大学出版社. [Shanghai, China: East China Normal University Press], p. 146.

The growth of teaching and research activities in schools did contribute to professional development in Chinese schools, and many teachers have had papers published in journals, and have helped students gain professional achievements. Teachers who participated in teaching and research activities actively were more willing to break through traditional expository and practice methods in teaching, while teachers who participated in teaching and research activities relied less on traditional teaching methods. Therefore, most teachers have become accustomed to regarding teaching and research activities as part of their professional routine, while practical research has become a widely-used research approach in primary and secondary schools.

Training Project of Famous Teachers and Famous Principals

In order to improve the overall quality of managerial teams and teaching staff, Shanghai implemented a key teacher training platform in 2011. On February 28, 2005, the SMEC started a "Training Project of Famous Teachers and Principals in Shanghai's General Teaching System." One thousand candidates were selected to receive training every year from young key teachers of every discipline. In

total, 5,000 were to be selected over five years. 500 key teachers and subject leaders were selected to be trained as “famous teachers.” This project aimed at equipping 100 teaching and educational experts with the latest international and domestic theories, strong teaching and research abilities in their professional disciplines and educational reform practice, to the ability to participate in international education communication and a high reputation on a national scale. Shanghai Municipal Education Commission issued a series of measures to promote the project, trying to build a group of teachers with international competitiveness (Sun, 2010).

On May 18, 2006, the first batch of students started school. On October 17, 2007, they completed the course. This marked the Project of Famous Teachers and Principals in Shanghai's General Teaching System as an initial success (Li, 2010).

Improvement of Comparatively Poor Schools in Shanghai

In the 2009 PISA project, grade distribution of different schools and students in Shanghai were far below the OECD average. Distribution difference of reading scores was small; the proportion of high level students was the highest and low level students was the lowest; there were small differences between colleges with a high balanced degree among schools. In reading achievement differences among the secondary school students in Shanghai, the ratio of differences at school level was 28%, while the OECD average ratio was 39%. At the same time, the influence of family economy and social background on student's achievement was also lower than the OECD average (Shanghai Project Team of PISA, 2010). It can be said that the key reason that Shanghai got high marks was that it improved the bottom level. Shanghai won due to the high achievements of students at a lower level, thus, the overall achievement distribution gap was small. This shows that the balance of Shanghai basic education, especially balanced development in the compulsory education stage achieved results. Xue Mingyang, director of Shanghai Municipal Education Commission, said at the conclusion of the PISA project in 2009: “what excited us were not results, but the scores that expressed the small difference between both ends of the students and the basic conclusion of high balance among schools and areas. It proved that long-term hard work have been very effective” (Xie, 2011, March 4). OECD countries noted the improvement of comparatively poor schools in Shanghai as a contributing factor in Shanghai's PISA performance.

Shanghai has always attached great importance to balanced development of basic education. In 1994, Shanghai proposed the slogan of “the first-class city, first-class education,” after which balanced educational development became a

focus, and the improvement of comparatively poor schools became an important strategy. Comparatively poor schools were improved in the following ways:

Hardware Improvement

At the beginning of 1990s, Shanghai launched many important projects such as “Project of Updating Comparatively Poor School,” “Project of Reaching the Standard of Primary and Secondary Schools,” “Project of Strengthening Secondary School Construction” and “Project of Strengthening the Construction of Informationized Environment Facilities of Rural Primary and Secondary Schools” to make the hardware construction basically achieve balance, providing equal education opportunities for students of the right age.

- Project of Updating Comparatively Poor Schools

Improvement of comparatively poor schools in Shanghai started in the 1980s. In the early 1990s, Shanghai underwent a second round of updates. In the mid 1990s, in order to meet the developmental needs of Shanghai at the turn of the century, Shanghai began a third round of improvements, formally implementing a “Project of Updating Comparatively Poor Schools.” Shanghai Municipal Party Committee and the municipal government decided to invest 200 million yuan in updating comparatively poor primary and secondary schools, which meant that Shanghai’s idea of “balanced development of hardware” to improve condition of running a school from fragmented thoughts to centralizing financial and materials resources to realize the breakthrough (Shen, 2011, February 18).

By the end of 1998, the three-year project was completed, improving 230 schools, and constructing 660,000 square meters of teaching rooms, increasing school building area by 430,000 square meters, and creating 1,593 classrooms. In addition, the municipal education committee established a subsidy system of “special funds for rural education,” spending 150 million yuan in 1997 and in 1998 acquiring equipment for rural schools (Li, 2010).

- Project of Upgrading Standards in Primary and Secondary Schools

In March 1998, a survey from the Shanghai Municipal Education Commission found that although Shanghai’s basic education had made a lot of progress, problems such as weak economic foundations in rural schools still existed. A large number of third and fourth class school buildings still existed, and first- or second-class school buildings were limited. At the same time, software was insufficient, in terms of teachers, quality of teaching and school management. Therefore, from 1999 to 2001, Shanghai introduced a “primary and secondary school standardization construction” project, planning to make 80% of primary and secondary schools reach the first- and second-class education standard, make

100% reach the first- and second-class education standard in five years.

After three years of hard work, three quarters of primary and secondary schools had undergone thorough improvements. Education teaching equipment facilities funding invested by the municipal government totaled almost 1.2 billion yuan, three times as much as that of three years previously. Special funds for rural education made the configuration of desks and chairs, physics, chemistry, biology, music, sports, aesthetics, labor and other special classroom new in most of the rural schools. Teachers' overall quality reached a decent standard. According to incomplete statistics, the ratio of key teachers in schools reaching the standard rose from less than 10% before 1999 to 25% in 2002 (Shen, 2002, December 31).

- Project of Strengthening Secondary School Construction

At the beginning of the 21st century, Shanghai basic education had developed into a comparatively effective system with a reasonable layout, but the structure and development of secondary schools lagged behind the development of high school and primary school, mainly manifested in the lack of investment and obvious intercollegiate differences. In order to urge Shanghai basic education to realize integral quality, Shanghai Municipal Government started a project of strengthening secondary school construction and promoting high quality secondary education, in September 2002. The final project determined 193 weak secondary schools as key construction projects, distributed in each district and county outside Jing'an District (Li, 2010).

By 2005, this project had invested 8.5 billion yuan, significantly improving weak running conditions in secondary schools. A batch of weak secondary schools were not only improved but also recognized in running conditions and education quality by the society. According to a survey of over 10,000 questionnaires, the degree of satisfaction of parents for the project was above 95%, the average class size in secondary school reduced from 45 in 2002 to 38 pupils in 2005 (Shen, 2007).

- Project of Strengthening the Construction of Informationized Environment Facilities of Rural Primary and Secondary Schools

The implementation of a sound information technology system is an important part of the modernization of education. In order to establish educational IT in rural schools, Shanghai set up an experimental school. In 2007, Shanghai Municipal Government listed more than 400 "construction of informationized environment facilities of rural primary and secondary schools" in the municipal work and practical projects to be implemented. The government at municipal and district levels invested nearly 300 million yuan in IT facilities for 492 suburban and rural primary and secondary schools. The two goals were "providing all

full-time teachers in rural primary and secondary schools with a computer for teaching” and “providing multi-media teaching equipment to central teaching places in schools” including multimedia teaching network terminal for central teaching places in rural primary and secondary schools (Li, 2010, p. 202).

After being connected to the IT system, rural schools were able to update teaching ideas and quality at the same speed as urban schools.

Software Improvement

Shanghai’s series of projects and measures helped diminish hardware differences between urban and suburban schools, and between high quality and comparatively poor schools. Software issues remained however. This included comparatively backward administration, overstaffing at managerial level; outdated and inefficient teaching methods, and shortcomings in the performance evaluation mechanism resulting in loss of key teachers and students. These problems need to be rectified in order to realize the comprehensive modernization of Shanghai’s basic education system. Concerning this problem, Shanghai has made some innovations.

- **Mandatory Administration**

In recent years, the number of students in secondary, primary and nursery schools in Shanghai suburbs has increased in total terms, year on year, with a ratio of 67% in the 2008 academic year. However, high quality educational resources in rural schools suffered from shortage, while students in urban schools made up 33% of students in all schools. They gathered abundant high-quality educational resources and brand agencies, to enable urban schools to play their proper role.

In this context, Shanghai Municipal Government developed mandatory administration. Specifically, the municipal Educational Commission funded professional services, and entrusted high-quality urban schools or educational intermediaries to manage comparatively poor rural primary and secondary schools in order to bring these schools up to an acceptable level of efficiency. Mandatory administration did not simply entail workforce and hardware upgrading, but also responsibility for leading the mandated school, and providing operational assistance and fresh ideas to help put in place better standards. The main problem for these comparatively poor rural schools was the lack the basic operational standards. Zhabei Secondary School, which has successfully managed eight schools, produced documents with as many as 128 clauses regarding the management process. In addition, the mandatory purpose was not only about changing the image of a school, but also about forming healthy competition among them, the so-called “catfish effect” brought on by innovation.

The assessment from Shanghai Educational Evaluation Institute to the first round 20 mandatory schools showed that 70% of rural students' learning habits, learning attitude and learning methods were greatly improved. In 2009, in the second round of mandatory administration, the number of supervised schools expanded to 43. In January 2011, a third round expanded the number of mandatory schools in rural and suburban areas. This indicates that mandatory administration management is becoming an innovative approach for rural primary and secondary schools' content development in Shanghai (Yan, 2011, February 17, p. 2).

- **Inter-County Assistance**

There is a clear difference between the quality of basic education in urban and suburban parts of Shanghai. In January 2005, under the co-ordination of Shanghai Municipal Educational Commission, nine suburban and nine rural areas signed "Cooperation and Exchange between Related Counties Education Agreement" and began a three-year period of joint development. The tone of this linkage was not top-down, but rather to develop all-round cooperation and exchange "area-to-area, department-to-department, school-to-school, teacher-to-teacher" in school management, team building, education and teaching, education and scientific research under the principle of complementary advantages, mutual cooperation, innovation, reform and common development.

By 2007, a total of 79 pairs of suburban-urban schools had been formed. The municipal educational commission selected 154 outstanding teachers from urban areas to support education in rural areas, and selected 61 young principals and teachers to corresponding city schools for taking temporary post and rotation training from suburban counties (Shen, 2007).

- **Teachers Preferential Policies in Suburban and Rural Primary and Secondary Schools**

Over the years, the development of a stable rural teaching workforce has continued to be a vexing problem. Since 2007, the Shanghai Municipal Educational Commission increased the tilt degree, implementing prior and preferential policy in profession titles assessment, determining that key city and district secondary school teachers with experience teaching in rural areas would have priority to senior teacher assessment in secondary schools. In order to encourage outstanding college graduates to teach in rural schools, the municipal education commission granted 30,000 yuan allowances for graduates who accepted posts in remote rural primary and secondary schools for three consecutive years (Shen, 2007). From 2009, Shanghai implemented a merit-based pay system in compulsory schools, unifying city standards and giving teachers in counties and urban-rural areas balanced incomes. The city also

implemented customized training programs for rural teachers.

At the same time, in order to develop balanced basic education, Shanghai promoted the orderly flow of teachers. Since 2007, SMEC chose teacher flow experiments within Changning and Nanhui District to break the path of “a school for all teachers” in terms of the recruitment of teachers, title assessment, welfare and treatment, examination and evaluation. Shanghai Municipal Educational Commission also studied the establishment exchange mechanism between urban and rural schools, between high-quality and comparatively poor schools, so as to mould the flow of senior teachers, special grade teachers and excellent principals to teach in rural areas, and attract outstanding teachers to teach in rural schools by extending the retirement age for senior teachers teaching in rural areas (Shen, 2007).

- **Information Training of Teachers in Rural Primary and Secondary Schools**

While implementing educational IT, the SMEC launched modern educational technology training of teachers in rural primary and secondary schools, and pilot projects of educational IT application pilot schools in 2007, training 30,000 teachers of modern educational and technical training, and determining the Jinri Secondary School in Nanhui District and Huacao Central Primary School in Huacao District as the first batch of experimental application schools of educational IT. In 2009, more than 400 primary and secondary schools carried out the practice of educational informationization in rural primary and secondary schools (Li, 2010, p. 203).

Special Allocation of Financial Resources for Compulsory Education in Shanghai

In order to ensure investment in educational appropriation funding in rural compulsory education in Shanghai and speed up the integration of urban and rural education, Shanghai improved the special allocation mechanism of financial resources for compulsory education. Since 2006, it has increased its co-ordination efforts in the municipal financing of compulsory education.

Establishing a Financial Transfer Payment System

With regard to the huge gap in student funding, public funding, teacher income and governmental financial investment between urban and rural areas in terms of the compulsory education system, Shanghai established a financial transfer payment system for compulsory education in 2006.

This financial transfer payment system refers to government financial

assistance through transfer payments for counties that have below average educational achievements. The annually increasing additional education fees was mainly spent subsidizing rural areas to develop compulsory education in the suburbs, especially in more remote areas. The finance and education sector in every district and county is required to allocate transfer payment and educational additional special funds transmitted by the municipal financial body to relevant schools without delay, embezzlement or offsetting regular education appropriations. Meanwhile, the finance body should further increase co-ordination of investment in compulsory education in the region, investing these educational appropriations in comparatively poor rural schools, and increasing the counterbalancing level of compulsory education in the region.

Since 2006, Shanghai Municipal Government granted funding according to the city's average appropriation standard for the counties below the standard of compulsory education students in the city. At the same time, annual allocation of special funds was used to develop compulsory education in the outer suburbs and in counties with financial difficulties. In 2006, Shanghai Municipal Financial Sector issued a special financial transfer payment of 260 million yuan for compulsory education, focusing on supporting Chongming, Fengxian and other suburban districts and counties. The SMEC allocated additional educational funds to the suburbs, rural areas and areas with economic difficulties, issuing a total of 993 million yuan in 2006, of which 756 million yuan were distributed to 10 suburban counties (Shen, 2007, April). In Shanghai's financial budget, 700 million yuan was allocated for the construction of schools in the suburbs and areas with economic difficulties, with particular attention paid to the outer suburbs (Shen & Ji, 2008, December 17).

As the municipal government increased transfer payments of additional education appropriations, the funding gap for students between rural areas and areas with economic difficulties and the average appropriations of the whole city has significantly narrowed, and is now near the city average. In 2006, Chongming Secondary School, ranking 11th in students' average educational appropriations, rose to 4th place after receiving municipal educational additional appropriations (Jiang, 2009, October). In the "Shanghai Medium- and Long-term Education Reform and Development Syllabus (2010–2020)," it continued to introduce "promoting standardization and equalization in the allocation of resources in compulsory education, increasing municipal financial transfer payments to reduce the financial investment gap among counties, establishing municipal co-ordination financial investment system of compulsory education, realizing a unified standard of compulsory school funding, teacher income, school configuration, and teacher allocation in 2020" (Shanghai Education Committee, 2010, September).

Establishing a Dynamic Adjustment System for Students' Average Public Fund Appropriation Criteria

In addition, in order to improve the public funding appropriation criteria for compulsory education, Shanghai established a standard dynamic adjustment system for average public funds appropriation. The average level of funding for students in primary and secondary school students increased to 1,400 yuan and 1,600 yuan from 2008, and to 1,600 yuan and 1,800 yuan from 2011 (Shen, 2011, February 18). The increased funds helped subsidize school water, electricity, gas and other expenses and to carry out quality education and other activities in schools after adjustment.

Adjustment of students' average public funds appropriation criteria in 2011 was calculated according to existing criteria, following the economic and social development of Shanghai and the financial situation in every district and county, as well as actual compulsory education needs. The adjustment plays a positive role in optimizing basic public resources service configuration in Shanghai education and promoting the balanced development of compulsory education.

Establishing a System of Investment, Use, and Supervision in Compulsory Education Funding

Shanghai Municipal Finance Bureau and the SMEC check the compulsory education funding levels of each district and county every year, and make comments to those that fail to meet the required standard of educational funding, offer additional financial resources to suburbs and counties, not use rural compulsory education funding according to the specified standard, hold back, embezzle transfer payments and additional special funds for compulsory education, and these count as reasons for reductions when arranging transfer payment funds in compulsory education in the following year.

In addition, schools that violate education funding regulations at the compulsory education stage are investigated at the leadership level, receiving appropriate censure according to the regulations. Shanghai Municipal Finance Bureau and the SMEC made an assessment and evaluation of investment guarantees and use conditions for compulsory education funding in every district and county, rewarding counties with outstanding achievements.

Reform of High School Enrollment in Shanghai

In order to reduce excessive competition for places in the best high schools, and the problem that parents of students overwhelmingly select some schools over

others, and to promote a balanced distribution of educational resources, Shanghai has experimented with a new admissions policy: a quota allocation system at senior high schools, making a pro-rata distribution of 10% of experimental model high and modern boarding high school to secondary schools in the area.

The quota allocation of senior high schools means allocating part of the quota of high-quality senior high schools to these junior high schools according to the number of junior high school students in the area. In other words, even students with the best performance in originally comparatively poor secondary schools were unable to be admitted to high-quality senior high schools, so parents selected other secondary schools. After the implementation of the quota system, regardless of the strength of the school, it had an equal quota of places in high-quality senior schools. As long as students achieved good results, they are likely to succeed.

Yin Houqing, deputy director of the SMEC, said the measure was aimed at some secondary schools that increased academic burdens in order to compete for enrollment quotas. The measure is intended to encourage ordinary junior high schools to improve teaching quality, and restrain excessive “school selection fever.” However, Yin stressed that the quota allocation was based on years of reform, a large decrease of overall differences in compulsory education level in Shanghai and a gradual reduction in the numbers of comparatively poor schools (Jiang, 2010, April).

Since 2008, the quota allocation in Shanghai experimental model high schools increased from 10% in 2008 to 12% in 2009, and to 15% in 2010. A large quota of good quality senior high school places was allocated to secondary schools, effectively alleviated the problem of school selection.

In 2011, Shanghai continued to implement enrollment methods for quota allocation to senior high schools, expanding the plan from 15% in 2010 to 18% in 2011 (excluding fee paying students), of which 5% were in suburban districts and counties (Morning Post, 2011, March 22). Meanwhile, the “Shanghai Medium- and Long-term Education Reform and Development Syllabus (2010–2020)” proposed that Shanghai good quality senior high schools would gradually reach 60% of the annual enrollment quota to each junior high school by 2020 (Shanghai Education Committee, 2010, September).

It can be seen that efforts in Shanghai basic education have expanded from compulsory educational resources to senior high school educational resources. In terms of quota allocation for senior high schools, it is “fair” to allocate according to student ratio, at least from the angle of horizontal equity (equal treatment of equals, to treat the same person or thing with the same approach), and the result is an extremely well balanced situation. Taking into account vertical equity (non-equal treatment of non-equals, to treat different people and things in

different ways) in ordinary junior high schools (these schools could not get so high enrollment rate according to their test scores), it plays a certain role in alleviating school selection fever.

Conclusion

In summary, the three traditional and six modern factors not only came together to affect the development of basic education in Shanghai, but also enabled Shanghai to achieve an outstanding performance in the PISA project. Although the above nine factors cannot be measured, they unconsciously influence education in Shanghai, and its teachers, parents and students. The three cultural factors show the influence of traditions on individual motivations, and the six policy-governed modern factors can be attributed to the guiding role that central government and relevant governmental sectors of Shanghai have played in basic education since reform and opening up.

In general, basic education in Shanghai has been developing in the right direction with openness, learning, exploration and reform coming more and more into play. By participating in the PISA project, students have exhibited high academic fulfillment and have taken the lead at the level of basic education, indicating the quality and the fairness of basic education in Shanghai. Moreover, the result was closely related to the nine traditional and modern factors discussed in this paper, factors which are the source of nourishment of basic education in Shanghai.

Finally, the authors want to remind readers of the reasons why Shanghai attended the PISA project: (1) to know about the quality and balanced development in global basic education; (2) to learn technical methods of educational assessment and find shortcomings, questions, or even blind spots in Shanghai's basic education; (3) to learn how to improve the adjustment of education policy on the basis of data, evidence and research since we hold that policy-argumentation without data is superficial and non-professional; (4) to learn about successful experiences in other countries and regions to provide references for education reforms and developments in China. Overall, the purpose of Shanghai's participation in the PISA project was to collect data through education assessments so as to make accurate decisions, deepen reform and development, promote educational equity and excellence and promote "the lifelong development of each student."

Bearing in mind the above-mentioned purposes of Shanghai attending PISA project, counter-measures to deal with problems shown in the results have been found; namely, (1) there is a need to enhance Chinese students' ability to read non-continuous texts and data analysis. Shanghai students are more adept at

reading continuous texts such as novels and essays, but relatively weak in reading non-continuous texts with diagrams, tables and lists. (2) there is a need to pay more attention to improving students' ability to "access and retrieve." (3) there is a need to strengthen students' self-control strategy and meta-cognitive learning strategies. (4) there is a need to reduce students' academic burden and learning hours. In the 65 countries and regions that participated in the PISA test, school hours per week in Shanghai ranked 14th and after-school catch up hours ranked 9th and the at-school and after-school total ranked 12th place (Shanghai Project Team of PISA, 2010). Chinese students have slightly heavier academic burden. (5) Shanghai must persevere in improving teacher training and professional development of teachers. (6) Shanghai needs to promote the quality of education in comparatively poorer schools and poorer areas. (7) Shanghai needs to develop methods, time and space for students to develop individual potential and talent. (8) Shanghai needs to establish multi-dimensional standards, new educational assessment and a school monitoring system.

Therefore, we should treat the outstanding performance of teenagers from Shanghai in the PISA project rationally. PISA is neither an Olympic competition nor a gold medal competition. It is not a matter of selecting the best one or champions, but an international test survey aimed at improving education policy. Moreover, PISA is not simply a way of assessing knowledge or skills, but a means of evaluating students' ability to solve real-life problems. In most participating countries, participants came from the entire country, while Shanghai is only one representative from China, so the results in Shanghai do not represent China. Since free compulsory education has been put in place in some countries, reading, mathematics and science are weak areas, which may lead to the assumption that Shanghai is comparing its strengths with other's weaknesses. The cost behind Shanghai's outstanding performance in the PISA project should also be considered, and Shanghai should work to reduce costs incurred by students themselves.

Acknowledgements This paper is part of the research findings of "International Organization and World Education Development Research" (BDA100026) funded by National Teaching Reform and Research in "Eleventh Five-Year Plan" of 2010. The research is also supported by Shanghai Project Group of PISA.

References

- Barmé, G. R. (1996). *Shades of Mao: The posthumous cult of the great leader*. Armonk, NY: M. E. Sharpe.
- Bates, R. (2007). *10,000 Chinese numbers*. Beijing, China: China History Press.

- Curricular Review Committee of Primary and Secondary Schools (Nursery Schools) in Shanghai. (2011). 为每一位学生的终身发展实践: 上海市中小学“二期课改”的探索与实践 [Exploration and practice of the “second phase of the reform” curricular review on primary and secondary schools in Shanghai: For the lifelong development practice of each student. 基础教育课程 [Curriculum of Primary Education], (1), 17–19.
- Ding, G. (Ed.). (2010). 中国中小学教师专业发展状况调查与政策分析报告 [Report of investigation and policy analysis of professional development of primary and secondary school teachers in China]. 上海, 中国: 华东师范大学出版社 [Shanghai, China: East China Normal University Press].
- Gu, M. Y., Kan, Y., & Qiao, H. (2008, December 30). 学科30年嬗变: 比较教育, 从批判外国到融入世界 [30 years' transformation in principles: Comparative education from criticizing foreign countries to being absorbed into the world]. 科学时报 [Science Times], 11.
- Hu, Y. M., & Yang, S. H. (2010). 学生学业成绩与教育期望关系研究: 基于西部五省区农村小学的实证分析 [Research on relationships between students' academic achievements and educational expectation based on an empirical analysis of rural primary schools in five western provinces]. 天中学刊 [Journal of Tianzhong], 25(6), 125–129.
- Jiang, H. B. (2009, October). 上海大力提升郊区教育水平实现教育均衡化 [Shanghai is making efforts to improve suburban education to bring about education balance]. Retrieved May 6, 2011, from <http://news.sohu.com/20091030/n267841183.shtml>. 2009.
- Jiang, H. B. (2010, April). 上海优质高中六成招生名额将“平均分配” [60% of admission quota of high-quality high schools in Shanghai will be equitably distributed]. Retrieved May 10, 2010, from <http://edu.people.com.cn/GB/11305888.htm>.
- Lau, S., Hui, A., & Ng, G. (Eds.). (2004). *Creativity: When east meets west*. Singapore: World Scientific Publishing.
- Li, J. (Ed.). (2010). 上海教育发展60年重大事件纪实 [Report on great events of 60-year educational development of Shanghai]. 上海, 中国: 上海教育出版社 [Shanghai, China: Shanghai Education Press].
- Littlejohn, R. L. (2011). *Confucianism: An introduction*. London, England, and New York, NY: I. B. Tauris
- Liu, H. F. (2000). 高考存废与科举存废 [Disposal of National College Entrance Examination and imperial examination]. 高等教育研究 [Higher Education Research], (2), 39–42.
- Liu, H. F. (2005). 为科举制平反 [Redress for imperial examination system]. 书屋 [Housebook], (1), 4–10.
- Liu, S. Y., Wang, C. L., Liu, J. J., & Han, H. P. (2009). 农村母亲文化程度对家庭教育投资目的与期望影响的统计考察 [Statistical inspection on the influence of rural mothers' educational degree on the aim and expectation of family-education investment]. 统计与决策 [Statistics and Decision], (6), 87–88.
- Lu, J., & Zhu, X. H. (2011). 如何看待上海2009年PISA测评结果: 中国上海中学生首次参加国际测评结果反响述评 [How to these the 2009 PISA results in Shanghai: A review of responses to PISA results by first time middle-school participants from Shanghai, China]. 上海教育科研 [Shanghai Research on Education], (1), 17–19.
- Ma, J. (2010, December 20). 上海学生全球测试考第一受欧美关注国内引争议 [That students from Shanghai rank first in national test draws attention from America and Europe and results in domestic debate]. 人民日报 [People's Daily].

- Mencius. (2009). *Mencius* (I. Bloom, Trans.). New York, NY: Columbia University Press.
- Morning Post. (2011, March 22). 沪中招政策公布 优质高中“名额分配”增至18% [Policy on high school admission in Shanghai is issued and “quota distribution” of high-quality high schools increased to 18%]. Retrieved November 6, 2011, from <http://news.qq.com/a/20110322/000309.htm>
- OECD. (2010). *PISA 2009 results: What students know and can do. Student performance in reading, mathematics and science* (Vol. I). Paris, France: OECD Publishing.
- Rao, N., Cheng, K-M, & Narain, K. (2003). Primary schooling in China and India: Understanding how socio-contextual factors moderate the role of the state. *International Review of Education*, 49(1-2), 153-176. doi:10.1023/A:1022969922200
- Shanghai Education Committee. (2010, September). 上海市中长期教育改革和发展规划纲要 (2010-2010) [Shanghai medium- and long-term education reform and development syllabus (2010-2020)]. Retrieved May 15, 2011, from <http://www.shmec.gov.cn/attach/xxgk/4335.doc>. 2010.
- Shanghai Project Team of PISA. (2010). 质量与公平: 上海 2009 年国际学生评估项目 (PISA) 结果概要 [Quality and fairness: Summary of results of 2009 PISA in Shanghai]. 上海, 中国: 上海教育出版社 [Shanghai, China: Shanghai Education Press].
- Shen, J. (2007, April). 本市示范性、实验性高中 6 成招生计划将均衡分配 [60% of the admission plans of exemplary and experimental high schools will be balanced]. Retrieved May 16, 2011, from http://www.spcsc.sh.cn/rdyw/content/2007-04/04/content_19232.htm.
- Shen, X. M. (2011, May). 在上海市基础教育工作会议上的讲话 [Report in the conference of primary education in Shanghai]. Retrieved October 31, 2011, from http://www.360doc.com/content/11/0318/23/451431_102442737.shtml
- Shen, Z. Y. (2002, December 31). 永载史册的“民心工程”: 上海市实施中小学标准化建设工程纪实 [A project corresponding to popular aspirations that will live forever in the history: Report on standardization of primary and secondary schools in Shanghai]. 中国教育报 [China Education Daily], (1).
- Shen, Z. Y. (2007). “起点公平”: 政府义不容辞之责. 看上海如何实现义务教育动态均衡 [“A fair starting point”: Bounded obligation of government. Analysis of how Shanghai creates a dynamic balance in compulsory education]. 上海教育 [Shanghai Education], (5), 18-19.
- Shen, Z. Y. (2011, February 18). 从“上海经验”到“世界财富”: 从学生 PISA 夺冠看上海市基础教育优质均衡发展 [From “Shanghai experience” to “global fortune”: Examining the high-quality and balanced development of basic education in Shanghai in light of PISA results]. 中国教育报 [China Education Daily]. Retrieved October 31, 2011, from http://www.jyb.cn/basc/xw/201102/t20110218_414511.html
- Shen, Z. Y., & Ji, L. (2008, December 17). 上海将加大投入力度全力补齐郊区教育“短板” [Shanghai is going all out to make the “shortlist” in suburban education]. 中国教育报 [China Education Daily].
- Song, B. Z., Cai, X. M., & Yang, J. L. (2003). 家长期望教育价值的思考与探索 [Thoughts and explorations on educational values of parents' expectation]. 唐都学刊 [Tangdu Journal], 19(3), 153-156.
- Su, J. (2010, December, 19). 对上海 2009 国际学生评估项目 (PISA) 结果的解读 [Interpretation of the PISA results in Shanghai in 2009]. 文汇报 [Wenhuipo].
- Sun, C. Y. (2010). 教师学习: 期望与现实. 以上海中小学教师为例 [Teachers' learning: Expectation and reality. Based on teachers in primary and secondary schools in Shanghai].

- [Unpublished doctoral dissertation], 上海师范大学教育学院 [Education College, Shanghai Normal University], 上海, 中国 [Shanghai, China].
- UNESCO. (2005). Memory of the world register: Golden lists of the Qing Dynasty imperial examination [Ref. No 2004-52]. Retrieved November 12, 2011, from http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/mow/nomination_forms/Golden%20Lists%20of%20the%20Qing%20Dynasty%20Imperial%20Examination.pdf
- Wang, D. J. (Ed.). (2011). 教育学 [Pedagogy]. 北京, 中国: 人民教育出版社 [Beijing, China: The People's Education Press].
- Wood, J. C. (Ed.). (1998). *Karl Marx's economics: Critical assessment* (Vol. I). London, England: Routledge.
- Xie, X. (2011, March 4). PISA 测试上海夺冠教育均衡并非可望不可即 [Balanced education is not undesirable seen from the championship of Shanghai in the PISA test]. 中国青年报 [China Youth]. Retrieved October 31, 2011, from http://news.xinhuanet.com/edu/2011-03/04/c_121146649.htm
- Yan, W. Q. (2011, February 17). 追求优质与均衡: 基础教育的“上海探索”之一 [The pursuit of high quality and balance: One of “Shanghai exploration” in primary education]. 光明日报 [Guangming Daily].
- Yu, K. (2010). *Diversification to a degree: An exploratory study of students' experience at four higher education institutions in China*. Bern, Switzerland: Peter Lang.
- Zhang, C. Y. (1996). *Chinese idioms and their stories*. Beijing, China: Foreign Languages Press.
- Zhang, W. M. (2007). 50%以上的人相信个人努力可改变命运: 当代中国人精神生活状况大型调查 [People of above 50% believe that personal exertions can change fate: A general investigation on current spiritual life of Chinese people]. 人民论坛 [People's Tribune], (8), 38–39.
- Zhou, B. (2005). 年级组与教研组的冲突与协作 [Conflicts and cooperation between classroom groups, and teaching and research groups]. 中小学管理 [Primary and Secondary School Management], (7), 10–11.