

Facilitating the Development of Mathematics Teachers' Expertise through Professional Promotion Practices in Mainland China

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ABSTRACT: Few may disagree that teachers' expertise in mathematics and pedagogy varies from one person to another and also affects their teaching performance. At the same time, few may consider the possibility of evaluating and promoting teachers with reference to their expertise in mathematics and pedagogy. In fact, China is such an education system that values teachers' expertise in mathematics and pedagogy in the practices of ranking and promoting teachers, especially at the advanced levels. This paper aims to introduce and discuss the teacher ranking and promotion system as a culturally valued practice in facilitating mathematics teachers' expertise development in China, and exemplify such a practice with the documentation of a master secondary mathematics teacher's professional development through the system.

Teachers and teaching have been recognized as a vital part of enhancing students' academic achievement (e.g., Sowder, 2007). Over the past decades, educational research has dramatically increased its emphasis on teachers and teaching practices (e.g., Sikula, 1996; Townsend & Bates, 2007). Teacher's knowledge is seen as a factor that seems to have the greatest power to carry forward our understanding of teachers and their teaching. In particular, there is a general consensus that teachers' mathematical knowledge for teaching is essential to effective classroom instruction (e.g., Ball, Hill, & Bass, 2005; RAND Mathematics Study Panel, 2003). Efforts to improve the quality of classroom instruction have thus led to the ever-increased attention in promoting the development of teachers' mathematical knowledge and skills for teaching.

The search for the most effective approaches to achieve excellence in mathematics education in many education systems has also led to the increased interest in teaching and teacher education practices in some high-achieving education systems, including China. In particular, recent investigations revealed remarkable differences between the U.S. and Chinese teachers in their mathematics knowledge for teaching (e.g., Ma, 1999). Paradoxically, Chinese mathematics teachers often received less formal education than their U.S. counterparts (Ma, 1999). A possible explanation is that Chinese teachers continue to improve their knowledge and skills for teaching over years (Li, Ma, & Pang, in press). Although it is recognized that China has a coherent teacher professional development system (Stewart, 2006), it is rarely examined what may happen in China and how Chinese teachers may experience different professional growth as compared to their counterparts in other education systems such as the United States. In this paper, we aim to

focus on the teacher profession promotion system being developed and used in China for supporting teachers' professional development in knowledge and skills, and the cultural and system context that supports the use of this practice.

TEACHER AS A PROFESSION IN CHINA: A BRIEF BACKGROUND

In Mainland China, the release of *Teacher Act* (Ministry of Education, 1994) was a crucial event that identified teacher's position and responsibility from the perspective of law. Later on, the release of *Regulation of Teacher Qualification* (Ministry of Education, 1995) further shaped the system of teacher professional qualification. According to the regulation of teacher qualification, the minimum education required for elementary school teachers is the completion of a three-year program offered by normal schools for junior secondary school graduates; for junior high school teachers is the completion of a three-year program offered by junior normal colleges for senior high school graduates; and for senior high school teachers is the completion of a 4-year bachelor degree program. Over the past two decades, the three-staged normal education has been established in Mainland China, and it has made significant contribution to educating teachers from elementary to secondary school teachers.

According to the regulation for secondary school teacher's position promotion, the positions of secondary teacher include senior (高级) teacher, intermediate (中级) teacher (level 1 and level 2), and primary (初级) teacher (level 3). For each level of teacher position, there is a specification in term of political, moral and academic aspects. For example, as a secondary school teacher at level 3, he/she should meet the following qualifications: political and moral qualification; a diploma of completing a three-year program after senior high school; one year probation and passing an examination, and demonstrate the basic knowledge on education, psychology and pedagogy, mathematical pedagogy; and also can teach at least one course at junior high school. The requirements for being a teacher at the senior rank include (1) five or more years' experience as a secondary school teacher at level 1 or with a Ph.D. degree, and (2) demonstrating the ability to take the responsibility as a 'senior' secondary teacher. In particular, the second condition is further specified as that the candidate should (a) have a systematic and sound academic training and specialized knowledge, plentiful teaching experience for being able to teach effectively, or specializing in political and moral education and classroom management and achieving high performance and getting rich experience; (b) engage in secondary school education research and teaching and be able to write teaching experience summaries, scientific reports and research papers that integrate theory and practice at certain academic level, or make remarkable contributions to the improvement of other teachers' academic level and teaching ability.

THE CONCEPTION AND STRATEGIES OF TEACHER PROFESSIONAL DEVELOPMENT IN CHINA

The Conception of Teacher Professional Development in China

The conception of teacher professional development in China shares some similarities but more differences with what teachers normally perceive in a Western context (e.g., Li, Kulm, & Smith, 2006). Although teachers' professional development may commonly be perceived as to improve teachers' knowledge and skills needed for teaching, there are big differences cross-culturally in terms of what needs teachers may perceive and how to improve as part of professional development. For example, when teachers' professional development in the United States are often provided in the form of workshops and recommendations, they are remote, inconsistent and can even be contradictory (e.g., Guskey, 2003). In contrast, teacher's professional development in China is taken as activities that are practical in nature. Rather than providing lengthy recommendations and workshops, professional development in China can happen in a teacher's daily life that is pertinent to the teacher's needs.

The cross-cultural difference in professional development relates to what is perceived as the professional nature of teaching. Teaching is taken as a professional, not private and personal, practice in China. There are common beliefs and values of what teachers need to do for students (“*Jiao Shu Yue Ren*”). Model teaching behavior is often established informally through frequent exchanges of ideas among teachers in and outside their own schools (e.g., Huang & Bao, 2006). In particular, master teachers¹ in China are often identified as ones who bear most of the culturally-valued moral characters and expertise for others to follow. What teachers can learn from others is the type of knowledge and skills that are publically valued and often locally proven as effective. Teachers realize the needs to learn and know what they can learn from others through their daily teaching activities. Teachers' expertise, reflected as knowledge and skills needed for and in mathematics teaching, is real and teachers acknowledge expertise differences from one teacher to another.

Strategies for Teacher Professional Development in China

Taking professional development as an independent effort, U.S. teachers receive information provided in professional publications about what can be considered as good instructional practice and what is needed for achieving that. Many large-scale professional development programs and workshops are also made available to facilitate teachers' professional growth and changes. Thus, the U.S. teachers' knowledge and skills for teaching is often enhanced through the approach of “learning from being told and by doing” (Li, Kulm, & Smith, 2006). In contrast, Chinese

¹ Master teachers refer to those with the senior rank (including an honorary rank) in this paper.

teachers' knowledge and skills for teaching are often improved through the approach of "learning from example and by doing". Some strategies have been in place for quite some years and they include (1) school-based apprenticeship approach; (2) school-based teaching research group; (3) teaching research activity organized by municipality; and (4) teaching contests (e.g., Huang, 2006). As all these strategies bear the feature of making professional development as pertinent to teachers' daily instruction that is also open to public scrutiny, they help to specify different aspects of teachers' expertise that is valued and important for developing effective teaching in China.

At the time when China has been undertaking curriculum reform over the past decade, teacher professional development becomes even more important. Given the fact that new content topics and innovative instructional ideas are implemented for classroom instruction, traditional strategies for professional development alone are not enough to meet these new challenges. Recent investigations have revealed that professional development is taking up some new approaches, while keeping valuable existing ones (Huang & Li, submitted). For example, the development of exemplary lessons, use of hypermedia for case development and distribution, and collaborations with education experts and teachers from other schools become favorable new strategies. Nevertheless, one fundamental feature stays the same, that is, teacher professional development still stems from teachers' needs and bears direct connections with what teachers need to do in their own classrooms.

FACILITATING TEACHERS' EXPERTISE DEVELOPMENT THROUGH PROFESSIONAL PROMOTION PRACTICES

Understanding Teacher Promotion Practices in China from Multiple Perspectives

Teachers' promotion practice itself is not a professional development, rather it functions as an important mechanism in specifying aspects of teacher's professional expertise valued for promotion and supporting teachers' professional development. The practice can be understood from a policy perspective to specify how this promotion system is administrated and implemented, from an academic perspective to examine what is valued as part of teachers' expertise in this promotion practice, as well as from a historical and socio-cultural perspective to understand why this promotion system and specific conception of expertise are valued.

From a policy perspective, this promotion system is presented as a bottom-up practice. It is a public policy that is outlined at the system level, but administrated at the provincial level. The teacher promotion system in China functions much in a similar way as the University faculty ranking system in the United States. The rank is used to recognize a teacher's professional achievement and is tied to the teacher's salary. However, the rank itself does not provide any

guarantee for a senior rank holder to have or keep a special prestige. Nor does the promotion system prevent junior teachers to move up, rather it promotes teachers' professional development.

From an academic perspective, the teacher profession promotion system spells out in details what the system values as teachers' professionalism. As the system only provides a general guideline, different provinces promulgate more detailed requirements and methods for ranking and promotion. After comparing requirements specified in several different provinces, it was found that they share many similarities. For example, an honorary ranking, teachers of exceptional class, is provided to teachers who are exemplary in many aspects. They are the model and experts in terms of moral, educating students, and teaching expertise. The general requirements for becoming teachers of exceptional class include: (1) certain quality and virtues such as, having a firm stand on basic mission of the communist party, patriotism, and devoted to peoples' education; educating students, being a person with exemplary virtue; (2) holding a senior rank, having a systematic and profound theoretical subject knowledge, having extensive teaching experience in that subject taught, achieving outstanding results in terms of students' learning outcomes, obtaining outstanding achievement in education reform and teaching research and curriculum development, and earning a high reputation in local education field; (3) making outstanding contribution in fostering junior teachers (Ministry of Education, 1993). Apart from these general requirements, the provincial regularity (e.g., Educational Bureau of Jiansu Province, 2004) provides further details including even quantitative measures. For example, in specifying the teaching quality, it is required that the teacher has developed his/her unique teaching style. The teacher is a leader of the teaching subject at municipal or county level, and has shown the quality of his/her teaching with some public and exemplary lessons. In specifying the expected contribution in education reform and research (esp. in teaching method research), it is required that the teacher needs to have a monograph, or more than three research papers published in journals at provincial level or beyond. In next section, the case of a teacher of the exceptional class is used to present a sample profile of expertise expected and valued, and also highlight the teacher's profile changes along with his professional promotion.

From a historical and socio-cultural perspective, the use of this promotion system and the specifications of expertise valued in China are socio-culturally situated. Because China has a long history in devising fair examination system for promoting public servants (Li, 2000), it is not surprising that a ranking and promotion system is used along with some specific measures. The specifications of moral and expertise needed for promotion are also nurtured in Chinese culture, where Chinese teachers are respected for having in-depth knowledge and being a moral example. In fact, researchers already documented some cross-cultural differences between China and Britain in what is viewed as a good teacher (e.g., Jin & Cortazzi, 1998; Beishuizen, et al.,

2001). Thus, a historical and socio-cultural perspective is important for developing a better understanding of Chinese ranking system that may not be portable to another system.

Taking a Holistic Look at the Teacher Profession Promotion in Practice: A Case Profile

Teachers of exceptional class in China are not just experienced teachers. They are part of the teaching culture in China and also play an important role in nurturing that culture. To have a better understanding about the teacher promotion system in China, we illustrate aspects of expertise that are valued through the case profile of such a Chinese mathematics teacher. We also highlight the teacher's profile changes along with the teacher's professional promotion journey.

1. A teacher's professional profile

Mr. Lin² obtained his bachelor degree in mathematics in 1982, and has been a secondary mathematics teacher since then. Due to his great teaching performance, he was able to transfer from one secondary school to another with a better reputation two times. From 1992 to 2001, he worked at a key school in an eastern city in China as a mathematics teacher and also an associate director in teaching research section. During this period, he completed a mathematics master course program, and participated in a provincial mathematics teacher leader training program and also a national key teacher training program. In addition, he had published several research papers in national key journals and won several awards in research paper excellence. His excellence in teaching and research were recognized with the award of excellent junior teacher at municipal level in 1994, earned his senior teacher rank in 1996. Those achievements let him become a mathematics teacher at a national key school in 2001. In the following six years (2001-2006), he made remarkable progress and achievements in teaching, research, teacher supervision and instructional materials development. Since then, he continues to publish research papers in teaching and develop instructional materials. He developed and presented 15 exemplary lessons and 16 teacher training lectures, and also supervised 7 junior teachers in an effort to contribute to the implementation of new curriculum. Eventually, he won the title of teaching master at the municipal level and exceptional class of teachers at provincial level in 2005. Table 1 outlines his professional profile.

Over the more than twenty years of teaching career, he described himself with two basic features: (1) as a person, he loves student, cherishes life, has modesty and pure-heartedness, humor and honesty; (2) as a teacher, he likes to have his own characters, passion for education, hard working and persistence, and erudition and versatility. He realizes that as a teacher, he influences students with individual care, transmits culture through exquisite teaching skills, and lays the foundation for their life and further development.

² All the names used in this paper are pseudonyms.

2. The teacher's professional profile changes along with the journey of promotion

Based on the Table 1, we can find certain relationships between Mr. Lin's accomplishment and his position levels. Before being promoted as a senior teacher, Mr. Lin had mainly pursued excellence in mathematics teaching. It was his success in teaching that led to his success in transferring from a county school to a key school at municipal level. After being promoted as a senior teacher in 1996, he has extended his teaching and academic activity to include teaching research, supervising junior teachers and education reform. His excellent performance in all these aspects led him to be honored as a teacher of exceptional class. As an exceptional class teacher, he has further extended his contribution. Compared with his accomplishments at the senior rank, he has paid more attention to the junior teacher supervision, and disseminated his experience in implementation of new curriculum at national and provincial levels through writing textbooks, giving public lectures and demonstrating exemplary lessons and so on. It is evident that the teacher's professional development is associated the promotion of his position.

Table 1. An outline of Mr. Lin's profile

Period	Award of teaching and research	Publication and project		Supervision	Education reform		
		Paper	Project		Teaching materials	Public lectures	Exemplary lesson
Before 1996.6	Senior secondary teacher (1996, "P"); Excellent junior teacher (1994, "C")						
1996.7-2005.6	Master teacher (2005, "M") Excellent educational researcher(2004, "M") Advanced talent for 21st century (2002, "M") Mathematics subject leader of intermediate-level teachers (2000, "M")	2 papers at "N" and 6 papers at "P". 4 of them were awarded the first-class prizes, and the others were awarded the second-class prizes at "P"	Chair and participate in 6 projects at "M" or above, and one of them was awarded excellence at "N"	two teachers	Middle school math textbook (60k words, "N"); High school math textbook (400k words, "N")	3 lectures at "P" and 5 lectures at "M"	1 lesson at "P" and 7 lessons at "M".
2005.7-2006.7	Exceptional teacher (2005, "P")			five teachers	Math textbook at high school (200,000 words, "N")	1 lecture at "N" and 9 lectures at "P"	1 lesson at "N", 3 lessons at "P", and 3 lessons at M

Note: "N", "P", "M" represents National, Provincial and Municipal levels respectively

CONCLUDING REMARKS

The issue of evaluating teacher's expertise and teacher promotion has been a perplexing one in many education systems. An explicit examination of relevant practices in China can advance our understanding of the issue. The case study provides further detailed information about Chinese teacher's expertise in mathematics and pedagogy, which can also help explain what is valued for and in Chinese classroom instruction. Taken together, this presentation aims to

provide a platform for both presenters and participants to examine and understand the issue across education systems. Moreover, the presentation aims to raise questions and issues for mathematics education researchers to guide critical examination of what can be learned from other education systems.

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