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Wei Liao & Sihua Hu

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## Chinese teachers' perceptions of academically oriented teacher preparation

Wei Liao<sup>a</sup>  and Sihua Hu<sup>b</sup> 

<sup>a</sup>Department of Teacher Education, Michigan State University, East Lansing, MI, USA; <sup>b</sup>Department of Counselling, Educational Psychology, and Special Education, Michigan State University, East Lansing, MI, USA

### ABSTRACT

Academically oriented teacher preparation, which prioritises subject matter knowledge for teaching, is still widely practised in Confucian societies. Few studies, however, have investigated the impact of this academic model on teaching practices in Confucian contexts. Drawing on interviews and classroom observations of six Chinese mathematics teachers, this study identifies the affordances and limitations of a typical academically oriented teacher preparation in today's China. Although this helped the sampled teachers establish their initial self-efficacy for teaching it limited the teachers' awareness of and their capacity for engaging *all* students to learn. The paper argues that academically oriented teacher preparation programmes in Confucian societies may need to reform their curricula so as to help their graduates advance both *excellence* and *equity* in education through their teaching.

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## Introduction

Academically oriented teacher preparation is a model for educating pre-service teachers, which 'emphasises the teacher's role as a scholar and a subject matter specialist' (Zeichner and Liston 1990, 4). This model rests on the belief that knowing what to teach largely determines a teacher's instructional capacity and quality. Programmes guided by this model often invest a large portion of their curricular resources in developing teacher candidates' subject matter knowledge. While the academic model may seem 'partial' or even 'outdated' compared to other more progressive teacher preparation models (e.g. the social justice oriented model, Cochran-Smith 2004), it is still widely practised in some Confucian societies, such as China, South Korea and Singapore (Leung, Graf, and Lopez-Real 2006). Confucian culture believes that teacher, the 'deliverer' of knowledge, should be knowledgeable; students should respect the authority of the teacher and their knowledge, follow the teacher's directions, and work hard to acquire knowledge (An 2006). Such educational beliefs sustain the practice of academically oriented teacher preparation in Confucian societies. However, as 'student-centred pedagogy' becomes a principle that guides education reforms internationally, including in Confucian societies, it also poses new challenges to this academic model for preparing teachers.

**CONTACT** Wei Liao  [liaoawei@msu.edu](mailto:liaoawei@msu.edu)

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Programme graduates' perception is a critical indicator for understanding the effectiveness of teacher preparation programmes (Darling-Hammond, Newton, and Wei 2010). It is the teachers who know best about whether, and in what ways, their pre-service education supports their teaching in their institutional and sociocultural contexts. To date, while the existing studies have examined several important aspects of academically oriented teacher preparation (e.g. Ball, Thames, and Phelps 2008), few studies have researched such programmes from the perspective of the graduated teachers, especially in Confucian contexts. To begin to fill the research gap, this study explored the teaching experience of six mathematics teachers who received their pre-service education in an academically oriented teacher preparation programme in the largest Confucian society, China. The question posed was: *From the teachers' perspective, how did their education in an academically oriented teacher preparation programme influence their teaching practices?*

## Methods

This study is part of a larger project investigating teacher education reforms in contemporary China. Using a case study methodology with semi-structured interviews and observations, the study selected six teachers who graduated from the Mathematics Educators-Secondary programme (MES) as the participants. Table 1 summarises the biographic information of the participants.

MES is one of the most selective programmes in preparing secondary mathematics teachers in China. Over nearly 100 years of its history, MES has formed the mission of 'preparing expert teachers who can lead mathematics education in the nation'. To serve that mission, its curriculum heavily emphasises mathematics subject matter knowledge (Table 2), which qualifies it as a typical case of the academically oriented programmes focused on in this study. Additionally, teachers were selected who graduated from MES only in recent years, hoping to capture the influence of the programme on the teachers' teaching practices before it was too diluted by other influential factors (e.g. teaching experience).

Each teacher was interviewed twice. Immediately before the first round of interviews, the interviewer observed two typical lessons of each teacher, chosen by the interviewed teachers. Cued by the lesson observations, in the first interview teachers were invited to elaborate on how the MES programme influenced their current teaching practice. Special focus was paid to the ways in which rich subject matter knowledge and limited pedagogical preparation that the teachers received in MES helped and/or impeded their teaching practice. During the second round of interviews, the preliminary findings were shared with the teachers to solicit their comments, and follow-up questions were posed so as to refine the themes emerging from the data.

**Table 1.** Participant information.

	Gender	Graduation years	Grade levels	Schools' academic ranks <sup>a</sup>
Lu	M	2011	12	Top
Hong	F	2011	11	Medium
Bing	M	2012	7	Medium
Li	F	2012	10	Medium
Jie	F	2013	10	Medium
Fa	M	2013	10	Top

<sup>a</sup>Ranked by the local governments based on schools' overall academic performance.

**Table 2.** Curriculum plan of the MES programme.

	Credits	Percentages (%)	Examples
Subject matter courses	91	54	Fuzzy Mathematics, Mathematical Logic, Intuitive Topology
Pedagogical courses	32	19	Foundations of Education, Educational Research, Student Teaching (8 weeks)
General education courses	45	27	Information Technology, English Language

Interview transcripts were coded in an iterative process of inductive coding and qualitative content analysis (Patton 2005), which led to several themes about the relationships between the MES programme and the teachers' teaching practice. Lesson observations and related textual data (e.g. MES programme plan, textbooks the teachers used) were used to triangulate interview findings and generate assertions.

## Findings

The study's results indicated three perceived connections between the MES programme and the teachers' teaching practices. First, rich subject matter knowledge afforded by the MES helped the sampled teachers establish their initial self-efficacy for teaching. For instance, Bing (all names used are pseudonyms) said,

You know, students nowadays are not easy to teach. Some of them even like to challenge teachers. However, I always feel I am backed by the rich knowledge I learned [in MES], which helped me earn my students' respect. (7 July 2015, interview 2)

Similarly, Lu used a 'water' metaphor to explain the association between teacher's knowledge and his capacity for teaching. 'If a teacher wants to give students a cup of water, she needs to have a bucket of it'. Lu appreciated that the MES programme had given him a lot of 'water', which made him feel qualified for teaching high school students. Both Li and Hong said because of their mastery of subject matter knowledge, they could quickly notice and correct students' mathematical mistakes. Such capacity helped them feel confident to walk into classrooms where they were always bombarded with many mathematical problems from their students.

Second, the teachers reported that the horizon subject matter knowledge they learned in MES (i.e. 'an awareness of how mathematical topics are related over the span of mathematics': Ball, Thames, and Phelps 2008, 403) enabled them to help students stretch further in mathematics learning when the students were motivated and cooperative. Due to the fierce competition for college admission in China, students are often compelled to learn more subject matter knowledge in order to succeed in the competition. Students in selective schools are likely to face additional pressure caused by their 'high-performing' peers and/or by themselves. Lu and Fa both worked in high performing schools (the top 10%) in their districts, which made it possible for them to teach their highly-motivated students and stretch them to their full potential. For instance, Fa was teaching 'probability' to his tenth graders. Most of the students had soon learned the definition of probability and solved several exemplary problems he prepared based on the school curriculum. Then, he decided to push the students to learn more and thus introduced the measure theory (a more comprehensive framework for conceptualising probability) to his students. 'Some of my students were very interested in this theory and came up to me for questions after the class. I would

have not been able to do so [help students learn more] if I did not learn the measure theory in MES'.

The other four teachers also reported their attempts to teach more advanced knowledge to their students, but most of those efforts failed due to students' lack of motivation or academic readiness. For instance, in her first year of teaching, Hong proposed to sacrifice her after-school time to give students additional instruction on the topics that her students performed poorly on in an exam, but few students showed interest, and Hong ultimately gave up.

Third, having received from the MES programme limited pedagogical preparation, the teachers encountered great challenges in engaging *all* students to learn. For instance, Li described her first few months of teaching as 'a disaster'. She lectured for most of the class time; her blackboard-writing was discursive; and she rarely encouraged students to share their mathematical thinking.

Students were not in my minds. My teaching was more like showing off myself rather than attending to my students' thinking or learning. (15 May 2014, interview 1)

Consequently, many of her students became disengaged in her class and the frequency of misbehaviour increased. Similarly, Hong said she often chose to correct students' mistakes immediately and directly at the beginning of her teaching, but such a method rendered her students' learning passive and mechanical. Hong eventually realised the necessity of teachers intentionally giving students some time to struggle and used appropriate instructional strategies (e.g. questioning techniques, group discussion) to help students construct their own paths of knowing. Reflecting on their teacher education experience, these teachers often attributed their early difficulties in teaching to the few opportunities to hone their pedagogy during the MES programme.

## Discussion and implications

This study identifies both the advantages and limitations of one current, typical academically oriented, teacher preparation in China. The findings suggest several conclusions. On the one hand, the MES programme examined afforded these Chinese teachers rich subject matter knowledge, which further led to their initially high sense of efficacy for teaching. Subject matter knowledge is the most important target of teaching and learning. For certain subject areas (e.g. mathematics) or grade levels (secondary), the subject matter knowledge to be taught was cognitively demanding, which entails teachers having a robust understanding of the targeted knowledge for leading and supporting student learning (Ball, Thames, and Phelps 2008). Thus, programmes that prepare teachers for those subject areas or grade levels may need to arm pre-service teachers with rich and solid subject matter knowledge. In addition, all six teachers felt strongly backed by their rich subject matter knowledge. This indicates an important source of a teacher's sense of efficacy: the mastery of subject matter knowledge. As teaching jobs are becoming increasingly demanding, teachers are susceptible to a series of negative emotions, especially when teaching difficult content or in high-pressure environments. Thus, strengthening teachers' subject matter knowledge in their pre-service education may help ease the intense psychological turbulence that teachers often experience at the early stage of their careers (Cess-Newsome 1999).

On the other hand, this MES programme did not fully prepare these six teachers in pedagogical approaches and strategies, which limited their awareness of and capacity for

engaging *all* students to learn. That Li characterised her teaching as a presentational 'showing off' rather than bilateral student–teacher interactions and adaptations indicates these teachers' lack of student-centred awareness. One generic feature of teaching is that success strongly depends on students' cooperation and input (Cohen 2011). Even in a knowledge-centred and examination-driven sociocultural context, such as the one these six teachers taught in, knowledgeable teachers would only advance the learning of a small number of motivated students, while the rest might barely benefit from the teachers' knowledge. Thus, pedagogical training is an equally, if not more important, component of teacher preparation programmes for preparing their graduates to notice, analyse and cater to their students' diverse learning needs (Caires and Almeida 2005).

Many studies have consistently found that knowing *what to teach* and *how to teach* are two indispensable preconditions for quality teaching (e.g. Ball, Thames, and Phelps 2008). China and other Confucian societies are now aiming to reform their education systems to be more learner-centred and equally accessible to all learners. To that end, their academically oriented teacher preparation programmes might also need to consider strengthening the pedagogical components of their curricula. At the same time they have to maintain a rigorous training in subject matter knowledge to help their graduates advance both excellence and equity in education through their future teaching.

The data for this study was drawn from a small number of teachers from one programme that possessed the salient features of the academically oriented model. Thus, the findings reported may not be completely generalisable to other programmes with unique characteristics. Future large-scale studies could use nationally representative samples across various teacher preparation programmes to explore further the relationships between the academically oriented teacher preparation and the teaching practice in Confucian societies, and it is hoped that the findings from this small-scale study can serve as a starting point for that endeavour.

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## ORCID

Wei Liao  <http://orcid.org/0000-0001-9987-3546>

Sihua Hu  <http://orcid.org/0000-0001-5904-6722>

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