

March 2016

## **Describing the Landscape of Teacher Training in China**

**Hongyang Liu, Liu Chengfang, Chang Fang and Prashant Loyalka**

### **Abstract**

The objective of this study is to describe the landscape of teacher training in China today. The description of China's teacher training program includes the prevalence of teacher training, the types of teachers attending NTTP, the content of teacher training, and the ways that teacher trainings are delivered. The paper also presents the subjective evaluations of principals and teachers. This paper makes use of the evidence provided by four diverse datasets to analyze and describe the landscape of teacher training. The results show NTTP training deviates from official policy objectives in several respects. The subjects of training programs and training content are not fully compliant with policy objectives. Also, the training opportunities are offered to a smaller proportion of rural teachers than urban teachers. From the subjective evaluations of teachers and principals, it is found that the proportion teachers and principals satisfied with NTTP training is lower than other types of training.

---

**Working Paper 290**

**March 2016**

**[reap.fsi.stanford.edu](http://reap.fsi.stanford.edu)**



## **Describing the Landscape of Teacher Training in China**

### **Abstract**

The objective of this study is to describe the landscape of teacher training in China today. The description of China's teacher training program includes the prevalence of teacher training, the types of teachers attending NTTP, the content of teacher training, and the ways that teacher trainings are delivered. The paper also presents the subjective evaluations of principals and teachers. This paper makes use of the evidence provided by four diverse datasets to analyze and describe the landscape of teacher training. The results show NTTP training deviates from official policy objectives in several respects. The subjects of training programs and training content are not fully compliant with policy objectives. Also, the training opportunities are offered to a smaller proportion of rural teachers than urban teachers. From the subjective evaluations of teachers and principals, it is found that the proportion teachers and principals satisfied with NTTP training is lower than other types of training.

**Keywords:** Teacher training; Landscape; Rural China

**JEL Codes:** I20, I25, R10

# **Describing the Landscape of Teacher Training in China**

## **I. Introduction**

Currently, China is experiencing an economic transformation from low-wage manufacturing toward higher-valued service industries (Zhang et al., 2011). Like many other developing countries, China requires increased levels of human capital to complete this economic transformation (Heckman and Yi, 2012; Autor, Levy, and Murnane, 2003). Without a labor force with sufficient skill, the country's economic development will ultimately stagnate (Hanushek and Woessman, 2012; Hanushek and Woessman, 2008; Mincer, 1984). Scholars agree that education is one of the most important inputs to a nation's economic development (Barro 1991, Psacharopoulos 1994; Schultz 1988), suggesting that increased investments in education can help sustain China's economic transformation.

Unfortunately, investments in education have not been made evenly across China. Today, students in rural areas of China lag behind those in urban areas in terms of both quantity and quality of education received. In China, rural children's school attainment rates are low and dropout rates from academic and vocational high schools are persistently high across all levels of schooling (e.g. Li et al., 2015; Shi et al., forthcoming). A series of in-the-field studies have found dropout rates ranging from 18% to 31% across junior high school venues in a number of different provinces (Shi et al., forthcoming; Mo et al., 2013; Yi et al., 2012, Wang et al., 2014; Yi et al., 2013; Li et al., 2015). An analysis of these studies concluded that among rural students who enter junior high school, only 37 percent go on to

graduate from high school (Shi et al., forthcoming). In addition, the academic performance of rural students is also worse than that of urban students. Students from poor rural counties perform significantly worse on the College Entrance Exam than those from non-poor counties, which are usually situated in urban areas (Loyalka et al., 2014). Based on empirical evidence, Lai et al. (2014) found that migrant school students outperform rural students by 2.7 points on a standardized math test. The achievement gap would be even wider if migrant students were integrated into ordinary urban public schools, suggesting that rural primary students are the most disadvantaged students in terms of academic performance.

There are many possible reasons why rural students—especially those from poor, rural areas—are lagging so far behind urban students in educational performance. Much of the achievement gap can likely be attributed to fundamental differences in financial and human resources between rural and urban areas. Rural schooling facilities are systematically worse than those in urban areas (World Bank, 2001; Wang et al., 2009). Similarly, because average incomes in urban areas are more than three times rural levels, parents of urban students also have more resources to put towards their children’s education (CNBS, 2011). It is also the case that parents of urban students have much higher levels of education and generally have more time and ability to help their children engage in the learning activities in school (Huang and Du, 2007).

While there may be different ways to narrow the achievement gap between rural and urban students, many scholars recognize that investing in the quality of teachers may be one of the single most important ways to influence student achievement (Darling-Hammond, 2000; Rivkin, Hanushek, & Kain, 2005; UNESCO, 2006). Using data from a 50-state survey

of education policies and performance in the United States, Darling-Hammond (2000) found that measures of teacher preparation and certification are by far the strongest correlates of student achievement. Using matched panel data from the UTD Texas Schools Project, Hanushek & Kain (2005) suggest that the effect of a ten-student reduction in class size is smaller than the benefit of moving a teacher one standard deviation higher up the teacher quality distribution. Such work highlights the importance of teacher effectiveness in the determination of student achievement.

Although fewer in number, studies from developing countries also have documented how variation in teacher quality can lead to substantial differences in student achievement (e.g. Metzler and Woessmann, 2012; Chu et al., 2015). Using a Peruvian 6<sup>th</sup>-grade dataset, Metzler and Woessmann (2012) found that a one standard deviation increase in subject-specific teacher achievement increases student achievement by about 9% of a standard deviation in math. By surveying 3947 students and 287 teachers in Shaanxi province in China, Chu et al. (2015) found that having a teacher with the highest rank (a credential based on annual assessments by local administrators) had a positive impact on student achievement relative to having a teacher who had not yet achieved the highest rank.

One method that has been found to be effective at improving teacher quality in some contexts is teacher training. From a review of nine experimental and quasi-experimental studies, Yoon et al. (2007) concluded that the measure of academic achievement of an average treatment student increased by 21 percentile points compared to that of an average control student when their teacher received substantial professional development (about 49 hours of training). Similarly, McEwan (2014) found that teacher training has one of the

largest mean effect sizes relative to other interventions targeting improvement in student grades from an evaluation of 77 randomized experiments that measured the effects of school-based interventions on learning in developing country primary schools.

Although there have been no rigorous impact evaluations of teacher training in China, this does not mean that China's government does not recognize the need to improve teacher quality. In 2010 the Chinese government began implementing the National Teacher Training Project (NTTP). From 2010 to 2013, the central government devoted nearly RMB 4.3 billion (US\$660 million) to fund training activities across the country (Yan, 2013). Policymakers at the national and provincial levels also have released a series of policy documents describing the objectives of the government's teacher training effort (e.g. MoE, 2010; MoE, 2011; MoE, 2012; State Council, 2010). For example, it has been mandated that each teacher in China will receive 360 hours of training over the next five years (Ministry of Education, 2011). It is clear that the NTTP is one of the key ways through which the education system will realize this goal.

In order to improve the instruction quality of teachers, especially rural teachers, the Ministry of Education has prescribed that the training content of the NTTP will focus on the development of teaching skills in terms of the *ethics and personal growth*, *content knowledge*, and *pedagogy of teachers*. Specifically, instruction in *ethics and personal growth* can help develop the social values and instructional experiences of teachers, allowing them to more easily understand and interact with their students; training in *content knowledge* ensures that teachers are adequately educated on the subjects they teach; and training in *pedagogy* can develop teaching methods that are more efficiently and effectively able to convey information

to students. The motivation for providing training in this format is to holistically improve the quality of instruction provided by China's teachers.

In spite of the large investment in teacher training and the nation's ambitious goals, there have been few studies comprehensively exploring the current state of NTTP implementation in China. Most studies that do exist only describe certain aspects of NTTP and/or analyze these issues using small samples or anecdotes. For example, Zuo and Su (2012) only provide subjective evaluations by trainees on the training received from just one training program. Li (2012) describes a single training program from the perspective of trainers, discussing the occupation and background of trainers (professors or classroom teachers) and the content of the training. Additionally, there is an absence of empirical-based research on the NTTP in the international, English-language literature. The two aforementioned studies were both written in Mandarin. In addition, since each of these studies were limited in scope, almost nothing is known about the current implementation landscape of the NTTP across China.

While the NTTP is the most visible manifestation of teacher training in China today, teacher training opportunities are also offered by other levels of the governmental system, including provincial, prefectural, and county levels. Many school districts and schools also organize and provide training opportunities for their teachers. Little quantitative research, however, has been undertaken to understand the prevalence of these different training opportunities (both NTTP and non-NTTP) and the relative perceptions teachers and principals have about the effectiveness of each type of training. In fact, to our knowledge only the study conducted by Chen and Wang (2013), which is published in the Chinese

literature, has examined the forms of training offered by different levels of government together.

The purpose of our study is to describe the landscape of teacher training in China today. To meet this goal, the paper pursues five specific objectives. First, we assess the prevalence of teacher training opportunities. Specifically, we investigate how many teachers are getting trained under the NTTP and programs offered by other levels of government. Second, we assess how educational officials target teachers for training, specifically examining what kinds of teachers are getting trained and how they are being selected. Third, we describe the content of teacher training and compare what we are finding to official policy goals. Fourth, we describe the ways that different forms of teacher training are delivered, both in terms of the types of trainers and the venues in which teachers receive training. Finally, we describe the subjective evaluations of principals and teachers on different types of teacher training and compare the perceived effectiveness of these different programs.

We believe our study constitutes a significant contribution to the literature on NTTP and other forms of teacher training in China. Our research employs a clearly defined sampling strategy and uses a substantial amount of both quantitative and qualitative data to describe the landscape of teacher training and provide a more detailed understanding of NTTP implementation. We are capable of doing this in terms of the prevalence of training opportunities, the nature of the target group, the training content and methods employed, and the subjective evaluations of teachers.

Our study, while ambitious, still faces several limitations. First, our data are just from Shaanxi province, which may mean that our study is not necessarily representative of all rural

areas of China. However, the comprehensiveness of our goals means that conducting a study in more than one province would be prohibitively difficult. Additionally, we do not analyze whether teacher training actually improves student learning and teacher quality. An evaluation of the impact of teacher training on student learning is beyond the scope of this paper. These limitations suggest that additional research on China's system of teacher training and its effect on the state of rural education is still necessary.

The remainder of the paper is structured as follows. Section II introduces the data employed in this paper, as well as the sample selection and data collection process. Section III reports the results of the study, which allow us to describe the landscape of teacher training in China today. Section IV discusses the results and concludes.

## **II. Data**

In this paper we make use of a varied range of different datasets to reach our stated objectives. In total, we rely on four types of data: *interview data*, *administrative data*, *principal and teacher survey data*, and *observational data*. The *interview data*, *principal and teacher survey data*, and *observational data* were collected by our research/coauthoring team, while a local government partner provided access to the *administrative dataset*. Detailed information on how we collected the four types of data is provided in Appendix A.

To gain a preliminary understanding of the way in which teacher training is carried out in China, we first conducted a series of interviews with a variety of actors who oversee, conduct, and receive teacher training in China (our *interview data*). Enumerators followed a detailed interview protocol with two groups of teachers (teachers who had and had not

attended onsite NTTP training in 2013), principals, government officials, and employees of teacher training institutions. In total, the research team conducted interviews with 21 teachers, 8 principals, 3 government officials, and 4 individuals at a local teacher training institution. The information gathered from these interviews was used to further investigate the channels through which teachers were targeted and selected to participate in forms of teacher training.

Second, we use *administrative data* that were created from data provided to us by the Shaanxi provincial NTTP office for three years (2011 to 2013). These data allow us to evaluate the prevalence of teacher training opportunities and to assess how teacher training targets are set and implemented across Shaanxi Province. Specifically, we use variables on the numbers and types of trainees, the allocation of training opportunities across different types of teachers, the subjects taught during training, and a categorization of the types of institutions that offered the training.

Third, in 2014 we collected survey data on the NTTP and other available forms of teacher training from a sample of 68 schools in two prefectures of Shaanxi Province. We refer to this as our *principal and teacher survey data*. This survey solicited information from respondents concerning the frequency and amount of training received during the 2013-14 academic school year, the training content provided, and the opinions of principals and teachers toward different forms of teacher training. Based on information from the *principal and teacher survey data*, we seek to understand the intensity of typical training sessions, the content of training, the opinions of principals and teachers regarding the training's effectiveness, as well as the process through which teachers were selected to participate in training.

Finally, in order to gain a richer understanding of the ways in which teacher training is conducted in China, members of our enumeration team also directly observed NTTP training sessions. These in-training session observations were carried out in two NTTP training courses in Xianyang and Weinan prefectures, Shaanxi province. In the rest of this paper these data are referred to as our *observational data*. While we do not seek to draw empirical-based, definitive conclusions from these non-quantitative data, seeing firsthand the way in which NTTP training is conducted allowed us to gain a more comprehensive interpretation of the landscape of teacher training.

### III. Results

In this section we report the results of our study. We first report on the prevalence of teacher training, both in terms of the NTTP and other forms of training. Then, we evaluate the types of teachers attending *NTTP on-site training*. Following this, we discuss our findings on the content provided within trainings. Next, we examine the ways in which teacher training is delivered. Finally, we assess the subjective evaluations of principals/teachers of different types of teacher training.

#### *The prevalence of teacher training opportunities*

Our findings provided insights into which forms of teacher training were the most accessible to our sample within our *principal and teacher survey data*. Our findings suggest that few teachers each year are provided the opportunity to attend *NTTP on-site training*. According to policy (Education Department of Shaanxi Provincial Government, 2011, 2012, 2013), the proportion of teachers in Shaanxi who are expected to attend on-site NTTP

training per year is only 1.8% of the province's teaching staff (Table 1, row 1, column 3). However, according to the *administrative data*, the actual number of training slots falls slightly short of the number of individuals that the province's NTTP office mandated. As seen from the table, in a typical year only 1.6% of teachers in Shaanxi actually attended on-site training.

**Table 1: The prevalence of teacher training opportunities per year in Shaanxi Province, China**

	Total number of teachers	On-site NTTP training		On-site and online NTTP training	
		No. of teachers trained (2011-2013)	Proportion of teachers trained (2011-2013)	No. of teachers trained (2011-2012)	Proportion of teachers trained (2011-2012)
Policy Mandated	273,346	15,140	1.8%	133,350	24%
Actual	273,346	12,726	1.6%	73,846	14%
<b>Difference</b>	<b>0</b>	<b>2,414</b>	<b>0.2%</b>	<b>59,504</b>	<b>11%</b>

Source: author's own calculations using the administrative data provided by the Education Department of Shaanxi Provincial Government

It is a different story for NTTP training that is provided online. Compared to *NTTP on-site training*, *NTTP online training* offers a greater number of teacher training opportunities. According to policy targets (Education Department of Shaanxi Provincial Government, 2010, 2011, 2012, 2013 and, 2014), 92% of all teachers participating in NTTP training were to participate in online training between 2010 and 2014 (Table 2, row 3, column 7). This would be about 23% of all teachers per year (92 percent/4 years). As shown by our data, the *actual* share of teachers that participated in online training was close to 90% both in 2011 and 2012 (Table 3, row 3, column 2 and 4). The NTTP training program is clearly one that is committed to on-line training.

**Table 2: Number of teachers *supposed* to attend NTTP from 2010-2014 in Shaanxi**

	2010	2011	2012	2013	2014	Total	Ration
Midwest short-term intensive training	5,920	3,800	3,050	3,860	6,282	22,912	6.0%
Midwest long-term intensive training	1,000	1,350	1,650	1,430	1,300	6,730	1.8%
Online Training	60,000	66,000	57,400	56,400	113,020	352,920	92.3%
Total	66,920	71,150	62,200	61,690	120,602	382,562	100%

Source: author's own calculations using the administrative data provided by the Education Department of Shaanxi Provincial Government

**Table 3: No. of teachers that *actually* attended NTTP training in the years 2011-2013 in Shaanxi**

	2011		2012		2013	Total
	No.	%	No.	%	No.	No.
Midwest short-term intensive training	3,230	8.1%	2,561	7.6%	3,196	8,987
Midwest long-term intensive training	1,166	2.9%	1,354	4.0%	1,219	3,739
Remote Training	35,535	89%	30,000	89%		
Total	39,931	100%	33,915	100%		

Source: author's own calculations using the administrative data provided by the Education Department of Shaanxi Provincial Government

Out of all forms of teacher training in China (inclusive of NTTP), we find that the type of training program that provided the most total training opportunities was county teacher training (Table 4, row 5, column 1). According to our data, 67 percent of teachers within our *principal and teacher survey data* attended county training in 2013. Other forms of training that offered large numbers of training opportunities were trainings provided at the city-level (available to 39% of sample teachers), through online and on-site NTTP training (available to 33% of sample teachers), and at the province-level (available to 22% of sample teachers—Table 4, row 1-3, column 1). As seen in table 4, about 89 percent of all teachers participated in training at least once in 2013. Therefore, in recent years almost all teachers in Shaanxi province received some form of training (Table 4, row 5, column 1). In short, training is a pervasive activity in China today (assuming local governments and school districts in other provinces are similarly active in providing teacher training).

**Table 4: The times and hours of teachers attending each levels of training in 2013**

Level of teacher training	% of teachers having participated at least once	Avg. Times attended	Avg. hours attended (cumulative course)	Avg. hours trained per course	Avg. days trained per course
National teacher training	33%	0.4	33	79.2	9.9
Province teacher training	23%	0.2	17.2	72.2	9.0
City teacher training	39%	0.5	19.3	42.7	5.3
County teacher training	67%	1.1	31.1	28.7	3.6
School district teacher training	37%	1.0	6.8	6.7	0.8
In-school teacher training	57%	3.9	14.6	3.7	0.5
<b>All types of training</b>	<b>89%</b>	<b>7.11</b>	<b>122</b>	<b>17.2</b>	<b>2.2</b>

source: Teachers data

However, when we examine the amount of training offered in terms of hours per course, we find that different programs provide different amounts of training, some more; others less. According to our *principal and teacher survey data*, higher levels of government generally administer greater numbers of training hours per training course. As seen in table 4, column 4, the hours trained per course through the NTTP (both in terms of online and on-site training) are the highest (79 hours per course). After the national teacher training, the amount of training hours offered by forms of government are the highest for provincial teacher training (72 hours per course), city teacher training (42 hours per course), and finally county teacher training (28 hours per course).

Table 4 also presents the cumulative hours attended per teacher provided by each form of training during the 2013 school year (Table 4, column 3). We find that NTTP (online and on-site) provided the most cumulative training hours per teacher in 2013 (33 hours). After NTTP, the amount of cumulative training hours offered per teacher are highest for county teacher training (31 hours), then city teacher training (19 hours), and finally province teacher training (17 hours).

Due to the fact that our surveyed sample is a subset of teachers who either attended NTTP or were similar to teachers who attended NTTP, there is a possibility that we may have overestimated the prevalence of training opportunities available to the average rural teacher. However, our findings are corroborated by data collected in 2012 surveying a large, randomly selected sample of schools in Shaanxi and Hebei Provinces (collected by the authors and described in Yi et al., 2015). Statistics from this data (not published in Yi et al.) demonstrate that the amount of teacher training opportunities available to rural teachers is

consistent with our findings. According to those data, teachers from rural Shaanxi and Hebei attended two trainings, on average, during the previous school year (Yi et al., 2015). Again, the data from different datasets (both those introduced by this paper and others in the literature) show that China is providing large amounts of training for many teachers every year.

### *Targeting teachers for teacher training*

Due to the fact that not all teachers are provided opportunities to receive every type of training, in this section we seek to determine which types of teachers receive *NTTP on-site training* and through what process they are selected to attend training. Due to the nature of our *administrative data* we are unable to examine the targeting practices of other forms of training. We examine which teachers are selected for *NTTP on-site training* in terms of rural/urban status and level of schooling (e.g., elementary school or junior high school) in which they teach.

According to our *administrative data*, among the trainees in the *NTTP on-site training* from 2011-2013, 66% are teachers from rural areas. Though this share of rural teachers meets mandated policy targets (MoE, 2010), it is actually less than the share of rural teachers in the province's overall teaching staff. We find that only 4.0% of rural teachers participated in on-site training from 2011 to 2013 whereas 6.8% of urban teachers did (Table 5, column 3). The differences between rural and urban participation rates suggests that, although the majority of trainees are rural teachers, the probability of rural teachers being offered an opportunity to participate in *NTTP on-site training* is significantly smaller than that of an urban teacher ( $P=0.00$ ).



**Table 5: Gap in access to *NTTP on-site training* between 2011-2013**

	Total No. of teachers	Trainees	Trainees as a percentage of total , %
Rural teachers	210,667	8,387	4.0%
Urban teachers	62,679	4,280	6.8%
Total	273,346	12,667	4.6%

Source: Administration data, and Shaanxi Province Education Statistics Yearbook in 2013

Using our *administrative data*, we also are able to analyze the level of schooling in which trainees in the NTTP on-site sessions teach. We do this by examining the target schooling level of NTTP training attended. According to our data, from 2011 to 2013, 57% of trainees in NTTP received training for junior high school teachers. During the same period, 27% of the trainees received training for primary school teachers. In the case of 12% of the trainees, the participants attended mixed junior high and primary school trainings. From these statistics, it seems clear that that the majority of *NTTP on-site training* positions were allocated to teachers employed in junior high schools.

In terms of the process through which training slots are allocated, our data suggest that this process can best be described as decentralized and opaque. According to the cases within *our interview data*, first the provincial NTTP office decides how many training programs will be conducted that year and how many teachers can attend. Then, the province decides on how to distribute the allotted training slots among its prefectures. From there, each prefecture decides how to allocate training slots among counties/districts. This process continues as training slots are further divided amongst school districts and schools.

According to our *interview data*, in principle, slots are allocated between each level of administration on the basis of population (with the larger prefectures, larger counties, and larger schools receiving more slots). The interviews also suggested that there is a fair amount of discretion in allocation decisions within each level and very limited oversight from higher levels of authority, as well as potential room for the influence of “*guanxi*” in slot allocation.

In addition, interviews suggested that teachers from more advantaged schools are disproportionately provided with opportunities to attend training. Because training slots are

given out to schools based on the number of teachers, those who teach at smaller, rural schools infrequently receive opportunities to attend NTTP trainings. Additionally, due to the fact that NTTP trainings are mostly conducted during the school year, teachers at these schools face barriers to attending trainings when there is no other teacher to cover their classes while they are gone.

After the training slots are allocated by the county to different schools, the principals decide which teachers will attend the training. Allocation of training spots within schools provides additional challenges. In theory, teachers either attend training totally voluntarily, voluntarily apply and then are chosen by their superior to attend, or their superior selects them to attend the training. Our *principal and teacher survey data* reflect that most (89 percent) participating teachers were ultimately chosen—often involuntarily—by their superiors to attend (Table 6, row 1-2, column 1). In fact, our data show that 39 percent of trainees were selected by their superiors without first applying to attend training (Table 6, row 1, column 1). When asked about this training selection process, many interviewees believed it was suboptimal. We were told more than once that when the process was fully controlled by the principal, it was often harmful to the quality of training provided. Unmotivated trainees often did not participate enthusiastically in the training and this was thought to diminish the effectiveness of the training.

**Table 6: The decisions of participating training at various levels in 2013**

Who decided whether you can participate the training	National %	Provincial %	City %	County %	School district %	School %
Completely decided by the superior	38.5	57.9	57.6	58.9	54.8	47.8
Voluntary application, and then determined by the superior	50.0	31.6	36.4	25.0	25.8	23.9
Entirely voluntary application	11.5	10.5	6.1	16.1	19.4	28.3
Obs.	28	19	33	56	31	48

Source: *principal and teacher survey data*

### *The training content of teacher training*

In this section, we present our findings concerning the content that is covered within NTTP and other forms of teacher training. In doing so, we will analyze the content in terms of the academic subject taught as well as its ability to instruct educators in the areas of *ethics and personal growth, content knowledge, and pedagogy*. We seek to assess this training content in terms of the requirements set by government.

Information provided by our *administrative data* allows us to examine the content of the training of *NTTP on-site training* programs, both in terms of academic subjects and topics concerning teaching strategies. Our findings suggest that the academic content taught in NTTP on-site training varies slightly from policy standards. Official subject matter designations for NTTP trainings reveal that 44% of teachers attending *NTTP on-site training* were being trained on content pertaining to core academic subjects (including Mathematics, Chinese Language, and English Language). Beyond the core academic subjects, 35% of teachers attending *NTTP on-site training* were instructed on elective classes (such as science, art, and history classes). The remaining 21% of teachers were instructed on other subjects, such as topics school management. Although the portion of teachers receiving training in elective subjects is in line with policy objectives (35%), the shares of teachers receiving training in core academic subjects and other subjects deviate slightly. According to the plans of policy that the portion of teachers receiving academic subjects and other subjects training are respectively 36% and 19% (Education Department of Shaanxi Provincial Government, 2011, 2012, 2013).

In addition, our data suggest that the distribution of training content in terms of the topics of *ethics and personal growth*, *content knowledge*, and *pedagogy* falls short of the standards stipulated by policy. According to the policy, in each training program instruction content should be allocated between *ethics and personal growth*, *content knowledge*, and *pedagogy* in proportions of 10%, 40%, and 50%, respectively, and, in principle, this allocation should not vary from the guideline targets by more than 5% (MoE, 2012). However, using the *principal and teacher survey data* we find that only 57% of trainees received instruction in *ethics and personal growth*, 79% of trainees received instruction in *content knowledge*, and 71% of trainees received instruction in *pedagogy*. In fact, only 18% of teachers reported having received all three components in through NTTP. This suggests that the actual training content frequently does not meet the requirements of national policy.

#### *The way teacher training is delivered*

In order to fulfill our next objective, we examined the way in which teacher training is delivered in *NTTP on-site training*. Specifically, we examine this in terms of both the venues in which the trainings are provided as well as in terms of what individuals instruct the trainings.

Through our *administrative data*, we learned that there are typically four venues at which teacher training is conducted: college campuses, primary schools, junior middle schools, and professional teacher training institutions. Our *administrative data* also suggest that training completed on college campuses is the most common, as 81% of teachers in this sample were trained on college campuses. Of all trainings in Shaanxi province conducted on college campuses, 93% were located in Xi'an city. However, only 11% of trainees in our

sample were from Xi'an. While having training in Xi'an might mean that the quality of the instructors is higher, it may have implications for the cost of conducting trainings. Clearly, when training is conducted away from home, out-of-pocket and opportunity costs can be high for teachers. There may also be issues regarding the appropriateness of training content to all school contexts.

Through our *observational data* and *interview data*, we also found that there were many instructors that were involved in each training program. According to policy documents (MoE, 2010; MoE, 2012), the team of instructors is supposed to consist of college experts, excellent frontline teachers, and education researchers<sup>1</sup>. The mix of occupations involved in the trainings is meant to ensure a high level of instruction quality (MoE, 2012). Though the qualifications of teacher set by policy suggest that training should be of high quality, from our *observational data* we observed that there was little communication between trainers on content and consistency. If this lack of communication is common, it could diminish the effectiveness of the training program on the whole, regardless of the capability of the instructors.

Additionally, according to our *interview data*, teacher trainings held in universities were typically taught by university professors. Though findings from our *interview data* alone cannot be deemed representative, this is consistent with the existing literature on teacher training in China (Chen and Wang, 2013; Zou, 2013). Although these professors may have a higher mastery of the content being taught, it may be the case that college professors may teach at too theoretical a level for rural teachers to understand and apply the lessons to

---

<sup>1</sup> Education researchers are selected from excellent and experienced frontline teachers, and mostly take charge of instructing the frontline teachers

their classrooms (Chen and Wang, 2013; Zeng and Nie, 2012). This assumption was corroborated by findings from our *interview data*, where most teachers interviewed reported that they believe college professors do not adequately understand the reality of teaching in rural areas.

#### *The subjective evaluations of principals/teachers of different types of teacher training*

Finally, within this section we compare the subjective evaluations of principals and teachers receiving different types of teacher training. This is done by soliciting responses to a Likert scale for satisfaction of the training provided by the NTTP as well as teacher trainings provided on the provincial, city, county, school district, and school levels.

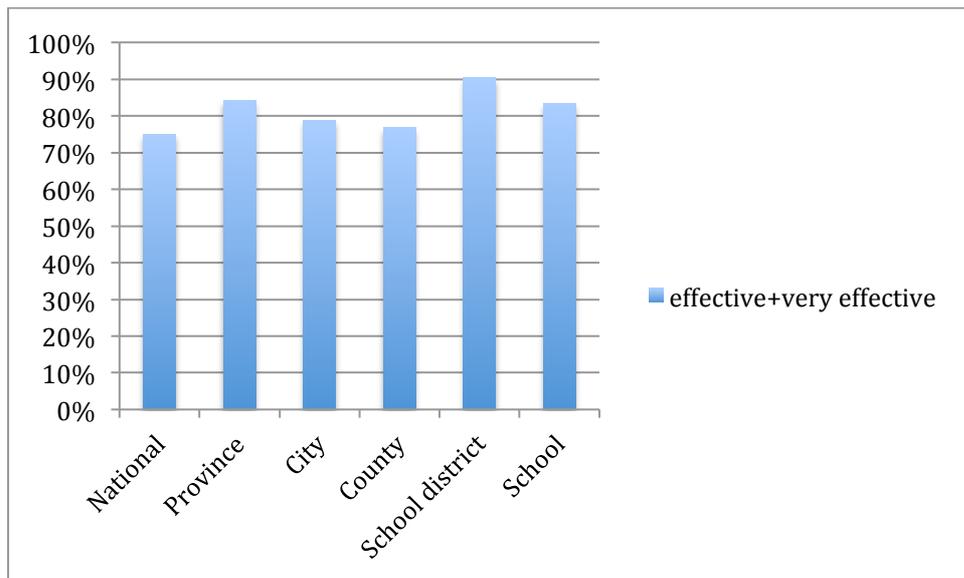
From Table 7, we find that the ratio of teachers who think NTTP training is *effective or very effective* is 75% (Table 7, column1, row 3-4). Though this satisfaction rating is high, it is not very different from other forms of training (Table 7, row 3-4). In fact, the satisfaction ratings of teachers for the NTTP are lower than other forms of training (Figure 1). Our findings suggest that teachers are most satisfied with trainings provided by school districts (90% of teacher rated *effective or very effective*). In addition, province and school training also receive high evaluation scores, as the proportion of teachers who rated these trainings as *effective or very effective* respectively are 84% and 83%, respectively. A smaller proportion of teachers found city-level teacher training to be *effective or very effective* (79%), but this is still higher than for NTTP training.

**Table 7: Teacher subjective rating of effectiveness of teacher training by level**

Whether is effective for you to participate in this training activities	Proportion of teachers selecting this option					
	National	Province	City	County	School district	School
No effect	7.1%	0.0%	3.0%	0.0%	3.2%	2.1%
Little effect	17.9%	15.8%	18.2%	23.2%	6.5%	14.6%
Effective	46.4%	36.8%	60.6%	51.8%	58.1%	58.3%
Very effective	28.6%	47.4%	18.2%	25.0%	32.3%	25.0%
Obs.	28	19	33	56	31	48

Source: Teachers data

**Figure 1: The subjective evaluations of teachers of different types of teacher training**



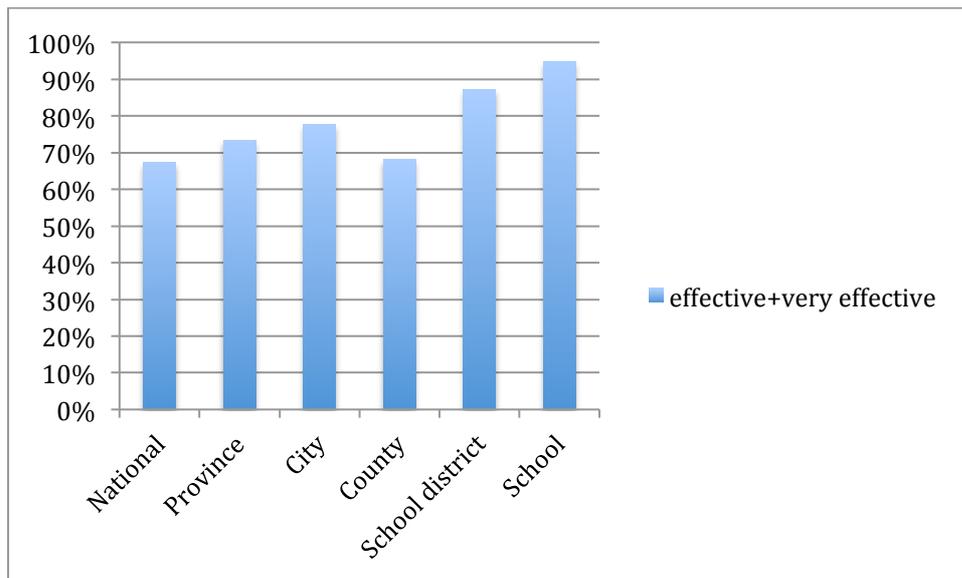
Likewise, the ratio of principals who think national teacher training is *Effective or Very effective* is only 67% (Table 8, column1, row 3-4), which is lower than other forms of training (Table 8, row 3-4; Figure 2). The form of training receiving the highest proportion of *effective or very effective* principal satisfaction ratings was school training (95%), followed by school district training (87%). The proportion of principals finding city-level (78%), province-level (73%), and county-level training (68%) as very effective are not particularly high, though still higher than that of national teacher training.

**Table 8: Principals subjective rating of effectiveness of teacher training by level**

Whether is it effective for your school to participate in this training activities	The proportion of principals selecting this options					
	National teacher training	Province teacher training	City teacher training	County teacher training	School district teacher training	School teacher training
No effect	1.8%	2.2%	0.0%	1.6%	0.0%	0.0%
Little effect	30.9%	24.4%	22.4%	30.2%	12.8%	5.2%
Effective	47.3%	46.7%	55.2%	44.4%	53.8%	63.8%
Very effective	20.0%	26.7%	22.4%	23.8%	33.3%	31.0%
Obs.	28	19	33	56	31	48

Source: Principals data

**Figure 2: The subjective evaluations of principals of different types of teacher training**



The findings concerning teacher and principal satisfaction with the NTTP are concerning given that NTTP is likely the most expensive training to implement, provides the most training hours, and is designed to be the most effective form of training. This suggests that the current implementation of NTTP may not be the most efficient use of resources and trainings implemented at lower levels of administration may be more effective.

#### **IV. Conclusions**

The intent of this study was to describe the landscape of teacher training in China today. Specifically, we report on the prevalence of teacher training, both in terms of the NTTP and other forms of training; we evaluate the types of teachers attending *NTTP on-site training*; we discuss our findings on the content provided within trainings; we examine the ways in which teacher training is delivered; and we assess the subjective evaluations of principals/teachers of different types of teacher training.

The findings of our research suggest that opportunities to receive teacher training are common. In total, more than 80% of teachers in China receive some form of teacher training. NTTP training provides the most training hours, but most of teachers attending NTTP participate in on-line rather than on-site training. Although it is consistent with policy mandates, we do not know to what extent online training can improve the overall quality of teachers. Other studies have found that only a small percentage of teachers (generally lower than 25%) think that online training is an effective training approach (e.g. Wan, 2014; Luo et al.; 2013; He and Chen, 2014).

We have also learned that NTTP training deviates from the official policy objectives in several dimensions. First, the subjects taught within training programs are not fully compliant with policy. Second, although we found that the trainees are mainly rural, junior high school teachers, the training opportunities are offered to a smaller proportion of rural teachers than urban teachers. Third, while the government provided detailed requirements for the content and structure of training content, in practice training content does not fully meet the provisions of the policy. The existence of these compliance problems may suggest that current NTTP implementation is inconsistent with the objective of improving the quality of teachers, especially China's rural teachers.

Our research also uncovered the manner in which teacher training is provided, both in terms of the venue of training and the qualifications of instructors. Although trainings are offered in a variety of locations, the vast majority of trainings are provided on college campuses. Additionally, though training instructors were carefully selected, many classes are taught by college professors. This may be concerning as it is possible that college professors teach at too theoretical a level for rural teachers to understand and apply the lessons to their classrooms. Also, it was observed that instructors rarely communicated with each other about course content and structure. This lack of communication may inhibit trainees from studying pedagogy and content knowledge systematically.

Lastly, we discovered that teachers and principals do not find NTTP teacher training to be particularly effective. Although the Chinese government has invested heavily in national training, teachers and principals give national teacher training a lower evaluation than other types. In the future, it may be necessary for the administrative departments of

government and the training institutions to evaluate the needs of teachers in order to better inform the design of training courses.

The inefficiencies in the current implementation of China's National Teacher Training Program raise concerns as to the country's future human capital growth. Students in rural areas of China already fallen behind those in urban areas in terms of both quantity and quality of education received. If this situation is not mediated, it might restrict the current and future development of human capital in China. Although our research has uncovered that there are still many deficiencies in the current teacher training administration, teacher training is still essential to improve the quality of Chinese teachers. Through this study, we have provided a comprehensive understanding of the landscape of teacher training in China. However, we are still unable to comment on how effective teacher training is at improving educational outcomes. Therefore, further research is needed to empirically assess the effect of Chinese teacher training on improving student achievement and teacher quality.

## References

- Autor D.H., Levy, F. and Murnane, R.J., 2003, "The skill content of recent technological change: an empirical exploration." *The Quarterly Journal of Economics*, Vol. 118 No. 4, pp. 1279-1333.
- Barro, R.J., 1991, "Economic Growth in a Cross Section of Countries." *The Quarterly Journal of Economics*, Vol. 106 No. 2, pp. 407-43.
- Chen, X. and Wang, Z., 2013, "The Survey of the Status and Problems of Teacher Training in the Stage of Compulsory Education." *Open Education Research*, Vol. 19 No. 4, pp. 11-19.
- China National Bureau of Statistics (CNBS), 2011, *China National Statistical Yearbook*. China State Statistical Press: Beijing, China.
- Chu, J.H., Loyalka, P., Chu, J., Qu, Q., Shi, Y., Li, G., and Rozelle, S., 2015, "The impact of Teacher Credentials on Student Achievement in China." *China Economic Review*, Vol. 36, pp.14-24.
- Darling-Hammond, L., 2000, "Teacher Quality and Student Achievement: A review of State Policy 2000." *Education Policy Analysis* Vol. 8 No. 1.
- Education Department of Shaanxi Provincial Government, 2010, "The Notification on Assigning Training Task of 'National Teacher Training-Shaanxi Province Backbone Teacher Training Program (2010)," [online; accessed 11 March 2015]. Available from: <http://www.snedu.gov.cn/news/jiaoyutingwenjian/201009/19/3841.html>.
- Education Department of Shaanxi Provincial Government, 2011, "The Notification on Assigning Training Task of 'National Teacher Training-Shaanxi Province Backbone Teacher Training Program (2011)," [online; 11 March 2015] Available from: <http://www.snedu.gov.cn/news/jiaoyutingwenjian/201107/25/3137.html>
- Education Department of Shaanxi Provincial Government, 2012, "The Notification on Assigning Training Task of 'National Teacher Training-Shaanxi Province Backbone Teacher Training Program (2012)," [online; 11 March 2015]. Available from: <http://www.snedu.gov.cn/news/jiaoyutingwenjian/201207/18/5187.html>
- Education Department of Shaanxi Provincial Government, 2013, "The Notification on Assigning Training Task of 'National Teacher Training-Shaanxi Province Backbone Teacher Training Program (2013)," [online; available 11 March 2015]. Available from: [http://sxsyxw.yanxiu.com/2013/xiangmudongtai\\_0812/264.html](http://sxsyxw.yanxiu.com/2013/xiangmudongtai_0812/264.html).
- Education Department of Shaanxi Provincial Government, 2013, *Shaanxi Province Education Statistics Yearbook*, Shaanxi: Shaanxi People's Education Press. [in Mandarin Chinese]
- Education Department of Shaanxi Provincial Government, 2014, "The Notification on Assigning Training Task of 'National Teacher Training-Shaanxi Province Backbone Teacher Training Program (2014)," [online; accessed 11 March 2015]. Available from: <http://snedu.gov.cn/news/jiaoyutingwenjian/201407/16/8147.html>.
- Hanushek E.A. and Woessmann L., 2008, "The role of cognitive skills in economic development." *Journal of Economic Literature*, Vol. 46, No. 3, pp. 607-668.
- Hanushek E.A. and Woessmann L., 2012, "Schooling, educational achievement, and the Latin American growth puzzle." *Journal of Development Economics*, Vol. 99, No. 2,

- pp. 497-512.
- He, Y., and Chen, X.X., 2014, "The Survey on the Teacher Training Needs of Gansu Rural Primary English Teacher." *Journal of Educational Institute of Jilin Province* Vol. 1 No. 30, pp. 86-89. [in Mandarin Chinese]
- Heckman J. and Yi, J., 2012, "Human capital, economic growth, and inequality in China", working paper No. w18100, *National Bureau of Economic Research*.
- Huang A. and Du, X., 2007, "Comparative Analysis of Urban and Rural Difference in Family Education in China." *Journal of Yibing University* Vol. 1, pp. 107-110. [in Mandarin Chinese]
- Lai F., Liu C., Luo R., Zhang L., Ma X., Bai Y., Sharbono B. and Rozelle S., 2014, "The Education of China's Migrant Children: The Missing Link in China's Education System." *International Journal of Educational Development*, Vol. 37, pp. 68-77.
- Li, F., Loyalka, P., Liu, C., Yi, H., Zhang, L., Chu, J., Johnson, N. and Rozelle, S., 2015, "The Impact of Conditional Cash Transfers on the Matriculation of Junior High School Students into Rural China's High Schools," REAP working paper, The Rural Education Action Program, Freeman Spogli Institute for Foreign Policy, Stanford, CA.
- Li, S. and Li, Y., 2013, "The Survey of National Teacher Training Program Long-term Training of Musicology" *Journal of Jiangxi Normal University* Vol. 46 No. 6, pp. 127-134.
- Li, Y., 2013, "The Situation and Reflection on the Implementation of Inner Mongolia National Training Plan" *Journal of Inner Mongolia Normal University* Vol. 12, No. 26, pp. 63-97. [in Mandarin Chinese]
- Loyalka, P., Chu, J., Wei, J., Johnson, N., Reniker, J., and Rozelle, S., forthcoming, "Inequalities in the Pathway to College in China: When Do Students from Poor Areas Fall Behind?" REAP working paper, The Rural Education Action Program, Freeman Spogli Institute for Foreign Policy, Stanford, CA.
- Luo Y., Zheng, Y., Cheng, S., and Long, H.J., 2013, "The Survey on the Need of Teacher Training Methods of Sichuan Vocational Teachers" *Journal of Chengdu Technological University*, Vol. 1, No. 16, pp. 73-76. [in Mandarin Chinese]
- Metzler, J. and Woessmann, L., 2012, "The Impact of Teacher Subject Knowledge on Student Achievement: Evidence from Within-teacher Within-student Variation." *Journal of Development Economics*, Vol. 99, No. 2, pp. 486-496.
- Mincer J., 1984, "Human Capital and Economic Growth." *Economics of Education Review* Vol. 3, No. 3.
- Ministry of Education of the People's Republic of China, 2011, "The Opinions on the Vigorously Strengthening Primary and Secondary School Teacher Training," [online; accessed 11 March 2015]. Available from: <http://www.moe.edu.cn/publicfiles/business/htmlfiles/moe/s4559/201101/114220.htm> [in Mandarin Chinese]
- Ministry of Education of the People's Republic of China, 2012, "National training plan' curriculum standards," [online; accessed 11 March 2015]. Available from: <http://www.sdchild.com/wjgg/2012-11-20/23559.html> [in Mandarin Chinese]

- Mo, D., Zhang, L., Yi, H., Luo, R., Rozelle, S., and Brinton, C., 2013, "School Dropouts and Conditional Cash Transfers: Evidence from a Randomised Controlled Trial in Rural China's Junior High Schools." *Journal of Development Studies*, Vol. 49, No. 2, pp. 190–207.
- Psacharopoulos, G., 1994, "Returns to Investment in Education: A Global Update." *World Development*, Vol. 22, No. 9, pp. 1325–1343.
- Rivkin, S., Hanushek, E., and Kain, J., 2005, "Teachers, schools, and academic achievement." *Econometrica*, Vol. 73, No. 2, pp. 417-458.
- Schultz, T.P., 1988, "Chapter 13: Education Investments and Returns," in *Handbook of Development Economics*, pp. 543–630.
- Shi, Y., Zhang, L., Ma, Y., Yi, H., Liu, C., Johnson, N., Chu, J., Loyalka, P., and Rozelle, S., forthcoming, "Dropout in rural China's secondary schools: a mixed methods analysis." *China Quarterly*.
- UNESCO Institute for Statistics, 2006, "Teachers and Educational Quality: Monitoring global needs for 2015." International Institute for Educational Planning, UNESCO, Montreal.
- Wan, Z.M., 2014, "The Survey on the Teacher Training Needs." *Teacher Development Forum*, Vol. 7, pp. 18-20.
- Wang, H., Chu, Y., He, F., Shi, Y., Qu, Q., Ullberg, E., Chu, J., and Rozelle, S., 2014, "Dropout and Mental Health in Rural China's Junior High Schools." REAP working paper, The Rural Education Action Program, Freeman Spogli Institute for Foreign Policy, Stanford, CA.
- Wang, X., Liu, C., Zhang, L., Luo, R., Shi, Y., Rozelle, S., and Sharbono, B., 2009, "What is Keeping the Poor out of College? Enrollment Rates, Educational Barriers and College Matriculation in China." *China Agricultural Economic Review*, Vol. 3, pp. 131 – 149.
- World Bank, 2001, "China: Challenges of Secondary Education," Second Education Series No. 22856, World Bank, Washington D.C.
- Yan H., Wei, F. and Li, B. 2013. "The Situation and Development of a Roadmap of Teacher Training," *Teacher Education*, Vol. 5, No. 6, pp. 43-50.
- Yi H., Song, Y., Liu, C., Huang, X., Zhang, L., Bai, Y., and Shi, Y., 2015, "Giving Kids a Head Start: The Impact of Early Commitment of Financial Aid on Poor Students in Rural China," *Journal of Development Economics*, Vol. 113, pp. 1-15.
- Yi H., Zhang, L., Luo, R., Shi, Y., Mo, D., Chen, X., Brinton, C., and Rozelle, S., 2012, "Dropping out: Why Are Students Leaving Junior High in China's Poor Rural Areas?" *International Journal of Educational Development*, Vol. 32, No. 4, pp. 555–63.
- Zeng, S.B. and Nie, W.P., 2012, "The Investigation on the Needs of Rural Teachers on Teacher Training" *Teacher Development*, Vol. 11, pp. 55-59.
- Zhang X.B., Yang, J. and Wang, S.L., (2011), "China has reached the Lewis turning point," *China Economic Review*, Vol. 22, No. 4, pp. 542-554.
- Zou, Q., Xiao, D., and Li, H., 2013, "The Survey and Analyze of the Continuing Education of Rural Primary and Junior High School Teachers by National Teacher Training

Program,” *Journal of Hubei University of Science and Technology*, Vol. 5, No. 33, pp. 153-156. [in Mandarin Chinese]

Zuo E. and Su, Q., 2012, “The Investigation of Rural Middle School Core Physical Education Teachers Participating in Hunan Province ‘National Training Program’” *Nenjiang Technology*, Vol. 3, No. 2, pp. 20-25.

Appendix A: Description of data sources

Name of dataset	Number of observations	Data Source
<i>Interview data</i>	21 teachers, 8 principals, 3 official, 4 organizations	First, in June 2014 we interviewed a series of 21 teachers and 8 principals in Tongchuan city (from a variety of rural and urban schools) to understand their experience with teacher training and the way in which training slots are allocated. In order to get more objective results, we made the interviewees consisted of two parts. One part was from a list of teachers who had attended onsite NTTP in 2013, and the list was provided to us by the NTTP office. The other part from a list of teachers who hadn't attended onsite NTTP in 2013, and this list was provided to us by Yijun County Education Bureau. After Yijun County Education Bureau provided the list of primary schools to us, we randomly chose 5 rural schools to interview. Second, we also interviewed 3 members of the Yijun county (in Tongchuan city) education bureau about teacher training allocation. Finally, in August 2014, we interviewed the directors responsible of leading NTTP teacher training sessions from four different training organizations
<i>Administrative data</i>	12726 trainees	The data were provided by Shaanxi provincial NTTP office. This is the bureaucratic office charged with planning and overseeing all NTTP activities within Shaanxi province. As part of their monitoring activities, the Shaanxi NTTP office tabulates the actual annual NTTP participation of all teachers in Shaanxi province and their basic information.
<i>Principal and Teacher Survey Data</i>	68 principals 84 teachers	The sample for this dataset was chosen in several steps. We first selected two specific training programs for primary school math under the purview of Shaanxi NTTP. We traveled in person to the October training sessions and enrolled all participants who were current primary school math teachers (34 teachers in total). We traveled to each of these participants' schools and checked to see whether there was another math teacher in that school that taught the same grade as the participant teacher. If there was, we enrolled this teacher in our sample (16 teachers in total). We then selected schools that were similar to the participants' schools. We then randomly selected one math teacher from the same grade as the participant teacher in each of these schools. Ultimately we included 34 teachers from these non-participant schools in our sample. We also interviewed the principal of each school. These schools were selected as the schools that best matched the trained teachers' schools in terms of three criteria: proximity to the school, number of students, and education quality as assessed by the county education bureau. During our survey collection we collected information on a total of 84 teachers (our teacher data) and 68 principals (our principal data).
<i>Observational Data</i>	2 observation	We conducted a one-day observation of the Xianyang training and half-a-day of observation of the Weinan training. The two training programs we observed are both part of NTTP's "immersion training" program, which is becoming one of the most important training models in Shaanxi province. Of all short-term onsite training, this model accounted for 65% in Shaanxi province. This type of training is defined by the fact that it takes place not on college campuses in faraway cities, but rather in "excellent" primary schools in teachers' own prefectures. The trainees have the opportunity to practice teaching sessions and then receive immediate evaluation from the trainers.

