



# Is Preservice Teacher Training Worth the Money? A Study of Teachers in Ethnic Minority Regions of the People's Republic of China

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One of the most intuitively plausible and widely held beliefs underlying educational development activities is that the most direct and efficient way to raise instructional quality is to improve the content knowledge and pedagogical expertise of teachers through increased levels of preservice and in-service training.<sup>1</sup> Teachers control the classroom activities most directly related to learning; they mediate students' encounters with content. As a consequence, teacher training, alone or in combination with other strategies, is the single most widely employed strategy to improve instructional quality in the developing world.<sup>2</sup> Unfortunately, while teacher training is arguably the single most popular intervention, it is also one of the most expensive. Not only are the unit costs of teacher training frequently high, the training raises the recurrent cost of education as teachers, once trained, command higher salaries. The investment may be worthwhile if the training results in higher quality instruction. However, if training does not yield the anticipated improvements in classroom instruction, a country can end up with a higher cost system without the intended benefits; in short, a less efficient system. Consequently, countries investing in teacher training as a means of raising instructional quality need to be sure that their strategy is having the intended effects.<sup>3</sup>

## Raising Educational Quality in the People's Republic of China

Improving the quality of education is one of the central education goals of the People's Republic of China (PRC), a main tenant of the current Five-

<sup>1</sup> D. W. Chapman and C. W. Snyder, Jr., "Teachers' Beliefs about Effective Teaching: A View from Botswana," in *Handbook of Teachers and Teacher Education in Botswana*, ed. P. T. Marope and D. W. Chapman (Gaborone, Botswana: Lentswe La Lesedi (Pty) Ltd., 1992), pp. 89–104.

<sup>2</sup> *Ibid.*; see also R. Craig, H. Kraft, and J. du Plessis, *Teacher Development: Making an Impact*, Advancing Basic Education and Literacy (ABEL) Project (Washington, D.C.), Academy for Educational Development and Human Development Network, Effective Schools and Teachers (Washington, D.C.: World Bank, 1998).

<sup>3</sup> Chapman and Snyder, "Teachers' Beliefs about Effective Teaching."

Year Plan and the subject of considerable national attention.<sup>4</sup> Particular concern is focused on ethnic minority areas, where education quality is widely recognized to have lagged behind other regions of the country.<sup>5</sup>

China, like many other countries, recognizes that educational quality changes only as the transactions between teachers and students at the classroom level change. Consequently, an important part of the government's effort to raise school quality has been a substantial investment in expanding teacher training. The central question in the present study is the extent to which teachers who have received greater amounts of preservice training actually employ different types of instructional practices in ways consistent with generally accepted notions of effective teaching.<sup>6</sup> In short, are teachers with more preservice training better teachers?

Specifically, this study investigated, first, the extent to which teachers in rural ethnic minority areas of the PRC with different levels of preservice training differed in their overall allocation of professional time. Second, at a more microlevel, the study examined the extent that these teachers differed in their allocation of in-classroom instructional time. The study is based on teacher data collected as part of a larger project conducted by the State Education Commission (now renamed the Ministry of Education) with assistance from the Asian Development Bank, which focused on strengthening the management of ethnic minority education in the PRC.<sup>7</sup>

The study contributes to two lines of policy research. First, it builds on and extends a stream of research that has examined the extent that preservice teacher training impacts subsequent instructional practice.<sup>8</sup> Second, it contributes to a growing body of empirical research on minority education in China.<sup>9</sup>

<sup>4</sup> *China Education Yearbook, 1998* (Beijing: People's Education Press, 1998).

<sup>5</sup> *Ethnic Minority Education Handbook, 1991* (Beijing: Ethnic Publishing House, 1991).

<sup>6</sup> While the education literature offers conflicting claims about what instructional practices constitute effective teaching, we argue that there is, nonetheless, a substantial and widespread consensus about the characteristics of effective teaching. This consensus is well documented in the work of M. G. Wang, G. D. Haertel, and H. J. Walberg, "Toward a Knowledge Base for School Learning," *Review of Educational Research* 63, no. 3 (1993): 249–94; J. Brophy and T. Good, *Looking in Classrooms*, 6th ed. (New York: Harper Collins, 1994); and M. L. Wittrock, *Handbook of Research on Teaching*, 3d ed. (New York: American Educational Research Association, 1986). Effective teaching includes such characteristics as clear, organized presentation of content, opportunity for guided student practice, feedback on performance, review, and maintenance of appropriate discipline.

<sup>7</sup> D. W. Chapman and G. Postiglione, *Strengthening the Department of Ethnic Minority Education in the People's Republic of China*, final report of T.A. no. 2455-PRC (Manila: Asian Development Bank, 1998).

<sup>8</sup> Marlaire Lockheed and Adrian Verspoor, *Improving Primary Education in Developing Countries: A Review of Policy Options* (Washington, D.C.: World Bank, 1990); Chapman and Snyder, "Teachers' Beliefs about Effective Teaching"; L. Anderson, E. Ryan, and B. Shapiro, *The IEA Classroom Environment Study* (Oxford: Pergamon, 1989).

<sup>9</sup> G. Postiglione, *Ethnic Minority Education in China: Culture, Schooling and Development* (New York: Garland, 1999), "National Minority Regions: Studying School Discontinuation," in *The Ethnographic Eye: Ethnographic Research on Education in China*, ed. J. Liu (New York: Garland, 1999), and "China's National Minorities and Educational Change," *Journal of Contemporary Asia* 22, no. 1 (1992): 20–44; and G. Postiglione, X. Teng, and Y. Ai, "Basic Education and School Discontinuation in National Minority Border Areas

*Impact of Teacher Training on Teachers' Instructional Practice*

For all of its intuitive appeal, teacher training is remarkably controversial as a strategy for improving teachers' instructional practices. Bruce Fuller,<sup>10</sup> reviewing 60 multivariate studies of school factors related to student achievement in the developing world, found that preservice training was positively related to student learning in only 12 of the 26 studies that included amount of teacher schooling as a variable. Even when positive relationships were found, the magnitude of the relationships tended to be only small to moderate. His findings suggest that, relative to the magnitude of the investment, the payoff from preservice training is often small. This concern is echoed and amplified in a major World Bank report in which Marlaine Lockheed and Adrian Verspoor argue that preservice teacher training has been largely ineffective in changing the quality of education.<sup>11</sup>

David W. Chapman and C. W. Snyder,<sup>12</sup> studying the relationship between the amount of preservice training and teachers' classroom practices in Botswana, found statistically significant and meaningful differences in observed classroom behavior of teachers who differed in level of preservice training but not always in the directions anticipated. Teachers with postgraduate training presented content more logically and made better use of teaching aids than did uncertified teachers. However, untrained teachers gave more attention to their lesson preparation, though they were less logical in their actual presentation of the material than were those with teacher training. Additionally, untrained teachers exhibited more of a student-development orientation in their use of discipline in the classroom.

In interpreting their findings, Chapman and Snyder suggest that teachers with more training attempt to organize more tightly their classes because

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of China," in *Social Change and Educational Development: Mainland China, Taiwan and Hong Kong*, ed. G. Postiglione and W. O. Lee (Hong Kong: Centre of Asian Studies, 1996), pp. 186–206; Chapman and Postiglione; Yang Xiuming, *Minzu jiaoyu de Yaolan* (Cradle of training teachers for nationalities) (Guiyang: Guizhou Education Publishing House, 1996); W. Borchigud, "The Impact of Urban Ethnic Education on Modern Mongolian Ethnicity, 1949–1966," in *Cultural Encounters on China's Ethnic Frontiers*, ed. Stevan Harrell (Seattle: University of Washington Press); J. LaMontagne, "Improving the Education of China's National Minorities," in *Education and Cultural Differences: New Perspectives*, ed. D. Ray and D. H. Poonwassie (New York: Garland, 1991); Xie Qihuang et al., eds., *Zhongguo minzu jiaoyu fazhan zhanlue jueze* (Choosing a strategy for developing China's minority education) (Beijing: Zhongyang minzu xueyuan chubanshe, 1991); Wang Qihong et al., eds., *Zhongguo bianjing minzu jiaoyu* (Education of minority nationalities living in China's border areas) (Beijing: Zhongyang minzu xueyuan chubanshe, 1990); Sun Ruoqiong et al., eds., *Zhongguo shaoshu minzu jiaoyuxue gailun* (An introduction to the education of China's national minorities) (Beijing: Zhongyang minzu xueyuan chubanshe, 1990); Julia Kwong and Hong Xiao, "Educational Equality among China's Minorities," *Comparative Education* 25, no. 2 (1989): 229–43.

<sup>10</sup> B. Fuller, "What School Factors Raise Achievement in the Third World?" *Review of Educational Research* 57, no. 3 (1987): 255–92, and "What Investments Raise Achievement in the Third World?" in *Improving Educational Quality: A Global Perspective*, ed. D. Chapman and C. Carrier (Westport, Conn.: Greenwood, 1990), pp. 2–43.

<sup>11</sup> Lockheed and Verspoor.

<sup>12</sup> Chapman and Snyder, "Teachers' Beliefs about Effective Teaching" (n. 1 above); C. W. Snyder, Jr., "Affective Contexts of Schools as a Potential Indicator of Teacher Receptivity to Instructional Change and Teacher Worklife Quality," in Chapman and Carrier, eds. pp. 153–70.

that decreases the complexity of their job.<sup>13</sup> Their training enables them to exercise better control, but that may come at the cost of deemphasizing some aspects of good teaching, particularly those aspects related to more active student participation. Thus, teacher training is valuable, but it can also be problematic. It provides teachers with skills they can use to structure their work environment, but they sometimes structure it to serve their own work life needs rather than to maximize the use of effective pedagogical strategy that might better enhance students' learning. There may sometimes be a tension, then, between pedagogical activities that most foster student learning and behaviors that reduce the complexity of teachers' lives.

Overall, the previous research suggests that preservice teacher training may make a small difference in teachers' subsequent instructional practice. Those differences, however, do not always suggest that more preservice training necessarily yields more desirable instructional practices.

*Strengthening Ethnic Minority Education in China*

Over 100 million of the 1.2 billion population in the PRC are classified as belonging to one of 55 officially designated ethnic minority nationalities.<sup>14</sup> Together, they constitute over 9 percent of the population and are found throughout China but especially in the western region and border areas, where the economy is less developed.<sup>15</sup> The constitution of the PRC provides for establishment of 156 ethnic minority autonomous areas, including five autonomous regions, 30 autonomous prefectures, and 121 autonomous counties.<sup>16</sup>

✱ Ethnic minority education in China is an integral part of the education system in the PRC and a major enterprise. The number of ethnic minority students attending all levels of the education system has increased in recent years. The proportion of ethnic minority students equals or exceeds their proportion in the national population in primary schools and in normal schools (*shifan xuexiao*).<sup>17</sup> The enrollment rate of ethnic minority children in school in 1996 was 93.62 percent in eight provinces and regions with large ethnic populations. The average for all ethnic minority regions is about 96.5 percent, and the average of all 56 ethnic groups cross-nationally is about 98.5 percent.<sup>18</sup> Within the ethnic minority regions, there are 103,139 pri-

<sup>13</sup> Snyder.

<sup>14</sup> *China's Ethnic Statistical Yearbook, 1996* (Beijing: Ethnic Publishing House, 1996).

<sup>15</sup> G. Postiglione, "National Minorities and National Policies in China," in *The National Question*, ed. B. Berberoglu (Philadelphia: Temple University Press, 1995).

<sup>16</sup> T. Heberer, *China and Its National Minorities: Autonomy or Assimilation* (New York: M. E. Sharpe, 1989); Ma, Yin, *China's National Minorities* (Beijing: Foreign Language Press, 1989).

<sup>17</sup> *Educational Statistics Yearbook of China, 1997* (Beijing: People's Education Press, 1998), p. 6.

<sup>18</sup> While this article uses official education data, readers are cautioned that there are widely recognized problems of data accuracy and meaning in national educational statistics in China, and the data cited may represent an overestimate of participation rates. Since the allocation of school resources is linked to enrollment, there is an incentive for school principals to inflate enrollment counts. Among other things, students are sometimes considered enrolled for the year even if they only attend a few days of class.

mary schools, 11,563 secondary schools, and over 40 postsecondary-level specialized ethnic minority normal schools and colleges.<sup>19</sup>

For much of the twentieth century, the quality of education in ethnic minority regions lagged behind the rest of the country. In an effort to address this problem, the government instituted a series of legal provisions that, among other things, allowed local adaptation of curriculum to increase relevance for minority students, allowed instruction in local minority languages, and, in some areas, provided for textbooks and instructional materials in local languages.<sup>20</sup> The government also increased the number of teacher training colleges serving ethnic minority regions, with special programs aimed at strengthening the preparation of teachers in those regions.<sup>21</sup>

#### *Teacher Preparation in the PRC*

Preservice teacher training in the PRC is offered in three types of institutions. Normal schools (*zhongdeng shifan xuexiao*) enroll graduates from junior secondary schools for 3–4 years' duration and provide preservice training for primary school teachers. Normal colleges (*shifan zhuanke xuexiao*) enroll graduates from senior secondary schools for 2–3 years and provide preservice training for junior secondary school teachers. Finally, normal universities (*shifan daxue*) enroll graduates of senior secondary schools and provide preservice training of 4 years' duration for senior secondary school teachers. There is an increasing trend to upgrade normal schools to the level of normal colleges. At present, normal universities still handle senior secondary teacher training. To date, comprehensive universities have not gotten involved in teacher preparation in a major way; however, the door may soon be open for them to do so.

Across all three of these settings, the training is intended to serve four purposes: (1) preservice preparation for beginning teachers, (2) training of instructors for the normal schools and colleges, (3) in-service training (usually carried out by education institutes [*jiaoyu xueyuan*]) to upgrade the skills of underqualified teachers already in the teaching force, and (4) continuing in-service education and support, which carries no formal accreditation but provides teachers with the opportunity to refresh and upgrade their knowledge and skills. Since the general content of the teacher preparation curriculum is fixed at the national level, preservice training in ethnic minority regions is similar to that elsewhere in China, though there are some regional variations (discussed below).

The preservice teacher preparation curriculum emphasizes subject knowledge. For the most part, pedagogy is approached from a theoretical

<sup>19</sup> Xia Yue, "Pengbo fazhan xinxi xiangrong" (Development and prosperity), *Zhongguo jiaoyu bao*, (China education daily), August 18, 1997, p. 1.

<sup>20</sup> G. Postiglione, "The Implications of Modernization for the Education of China's National Minorities," in his *Education and Modernization: The Chinese Experience* (London: Pergamon Press, 1992).

<sup>21</sup> Yang.

point of view (though there are some practical methods courses). Each institution has some flexibility in its own curricula, except in subject areas of Chinese, math, and science. Greater flexibility is allowed in the curricula for geography, arts and craft, music, and sports. This flexibility is important, because these topics are more likely to be shaped by local interest and may be more closely relevant to the local situation, sometimes even to ethnic minorities. Within these parameters, all teachers follow essentially the same course program, with few differences across geographical areas.

The main difference across geographical areas is in the length of preservice programs. Depending on location, programs may be either 3 or 4 years in length. This may be due to differences in the length of primary schooling in different locations. For example, teacher training in Guizhou is a 3-year program while in Gansu it is a 4-year program. Students entering preservice training in Gansu (where much of rural primary schooling lasts 5 years) have a total of 8 years of schooling before entering a normal school; those in Guizhou (where much of rural primary schooling lasts 6 years) will have had 9 years of prior schooling. Gansu may be adding an extra year of normal school to make up for the one less year in primary school. Naturally, the length of normal school education (3 or 4 years) will affect the curriculum.

While all teachers generally follow the same course program, in some provinces (e.g., Guizhou) there are special courses in the ethnic minority normal schools for primary school teacher training for students from remote areas (mostly minorities) who are admitted with lower scores and who take fewer difficult subjects (i.e., art and music rather than physics and chemistry). Only a small group of students takes these special courses, and they are targeted to teach in remote primary schools that do not go beyond primary grade 3. The rationale is that these teachers will raise the enrollment rates in remote areas by teaching more art, music, and physical education than other teachers, and they will teach it well and creatively. In fact, this is thought to be part of the "quality education movement," one component of which emphasizes learning other than pure academic subjects. Some of these students also get special training in how to teach in multi-grade, one-room school settings called teaching points (*jiaoxuedian*). Once in the schools, most primary teachers teach two or three subject areas and, in small rural schools, they may teach more than that.

Appendix table A1 presents the curriculum for a 3-year normal school located in an ethnic minority area. This 3-year school offers three programs: regular teacher, teacher for remote schools, and preschool. As the data illustrate, the remote teacher groups (consisting of a high proportion of ethnic minorities) take less of everything except language and math classes.

In summary, ethnic minorities study most of the same things that their Han counterparts do. However, some may take different optional units, ei-

ther as part of the remote teacher class or by their own choice. Additionally, in some provinces there is a high content of bilingual education as part of teacher training, especially in those provinces where minorities have an established written language (Tibetan, Korean, Kazak, Uyghur, and Mongol). Nevertheless, the basic requirements are set at the national level. The rest is determined provincially, with a small amount of variation allowed at the individual institution level.

The central premises of the present study are, first, that the preservice preparation teachers receive shapes what they regard as effective in-classroom teaching practices and, consequently, the time they subsequently allocate to those practices; second, that their preservice preparation also shapes out-of-class activities, which they believe support student learning, and the time they allocate to those activities once they are teachers.

#### *Shaping the Teacher Training Curriculum*

One constraint on Ministry of Education efforts to design teacher training and to improve classroom instruction has been the lack of information on instructional practices at the school and community level. Due to the sheer size of the country, teacher data are collected and aggregated at the county level and aggregated again at the provincial level. Central education authorities do not have easy access to individual teacher characteristics. Moreover, little attention has been given to the investigation of teachers' instructional practices.<sup>22</sup> Since these are ethnic minority regions, the issue is more complicated because of the need for bilingual education and the variability in teachers' ability to respond to that need. While recent teacher survey data indicate there is quite a bit of experimentation going on in some classrooms, central education authorities lack any comprehensive view of teachers' classroom practices.<sup>23</sup> This lack of information seriously limits the efforts of government and educators to improve teacher training in ways that will eventually lead to improved classroom pedagogical practices. The issue is receiving attention because improving teaching quality is a stated part of China's effort to implement the central policy calling for 9 years of compulsory education.<sup>24</sup>

#### **The Present Study**

Preservice training in most countries is intended both to strengthen teachers' knowledge of content and alter teachers' pedagogical practices in ways that lead to better teaching. This improved content knowledge and

<sup>22</sup> Chapman and Postiglione (n. 7 above).

<sup>23</sup> Ibid.

<sup>24</sup> Ibid.; G. Fairbrother, "Quality Education in 1996: Selections from China Education Daily," *Chinese Education and Society* 30, no. 6 (1996).

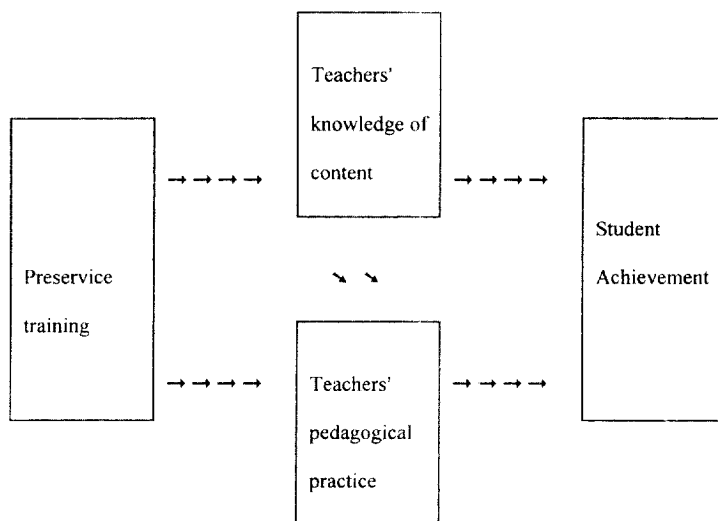


FIG. 1.—Model of impact preservice teacher training on student achievement

practice, in turn, will presumably lead to greater student learning (fig. 1). However, previous research is divided as to whether teacher training is most appropriately examined in relation to teachers' subsequent classroom practice or to eventual student achievement.<sup>25</sup> Studies that seek to link preservice teacher training to students' subsequent achievement face serious methodological dilemmas. In particular, while student achievement is the central outcome of interest to policy makers and parents, achievement is influenced by a variety of factors beyond the direct control of teachers. For example, students' aptitude, family background, the availability of instructional materials, and the quality of school leadership are all related to how well students learn. The impact of teacher training on student achievement is indirect at best. Training is intended to change teachers' classroom behavior.

This study tests only one part of the full model—the extent that teachers with more training employ effective teaching practices to a greater degree than teachers who have not received that training—but it is that part that most directly relates to the immediate outputs of teacher training. Within this focus, the study examines two aspects of teacher practice: teachers' overall allocation of professional time and their use of in-class instructional time, both related to teacher effectiveness and student achievement.

<sup>25</sup> Fuller, "What School Factors," and "What Investments Raise Achievement" (both in n. 10 above); Chapman and Snyder, "Teachers' Beliefs about Effective Teaching" (n. 1 above). In China it is commonly accepted that student achievement is the responsibility of the student. Working hard is considered more relevant than intelligence. For example, in Guizhou Province, 86 percent of the teachers surveyed assigned more importance to hard work than to intelligence in accounting for student learning (Postiglione et al., 1998).



TABLE 1  
DURATION OF THE SCHOOL YEAR IN HOURS, DAYS, AND WEEKS, 1991 DATA

Country	Hours per Week	Days per Week	Weeks per Year	Hours per Year	Days per Year
Fiji	25	5	41	1,025	205
Kiribati	...	5	39	...	195
Korea	29	6	34	986	204
Lao PDR	25	5	33	825	165
Malaysia	24*	5	42	1,008	210
Mongolia	21	...	33	693	...
Pakistan	26	7	29	754	174
Papua New Guinea	40	6	40	1,600	200
Philippines	25*	6	37	925	185
Sri Lanka	30	6	40	1,200	200
Thailand	30*	6	40	1,200	200
Samoa	...	...	40	...	208
Tonga	24	6	39	936	234
Tuvalu	25	5	40	1,000	200
Vanuatu	30	5	36	1,080	180

SOURCE.—Unesco Statistical Issues (STE-4) (Bangkok: Unesco-PROAP), p. 2, as reported in D. W. Chapman and D. Adams, *Trends and Issues in Education Quality in Asia* (Manila: Asian Development Bank, 1998).

\*An average of different duration within the first level.

#### *Allocation of In-Classroom Instructional Time*

Nations differ widely in the amount of instructional time they require for students in a given week or year (table 1). Research indicates that the more hours students attend school, the more they tend to learn.<sup>26</sup> How much more depends on how that classroom time is used. In many countries, large amounts of time are spent in classroom management, discipline, or non-instructional activities (e.g., farming or other commercial activities required to help fund the school). A considerable body of international research has documented the positive relationship between the amount of classroom time actually used for instruction and the amount students actually learn.<sup>27</sup>

#### *Use of Out-of-Classroom Time Related to Instruction*

How teachers spend their out-of-class time is also related to student learning. In countries in which teachers are poorly paid, teachers often augment their income with supplementary employment that competes for time they would otherwise devote to lesson preparation or other school activities.<sup>28</sup> In other countries, out-of-school time is invested in activities that support the instructional mission of the school. Teachers' actions to plan and prepare les-

<sup>26</sup> B. Fuller, D. Holsinger et al., *Secondary Education in Developing Countries* (Washington, D.C.: World Bank, 1993).

<sup>27</sup> Wang, Haertel, and Walberg (n. 6 above); Fuller, "What School Factors," and "What Investments in Achievement."

<sup>28</sup> See M. Bray, *The Shadow Education System: Private Tutoring and Its Implications for Planners* (Paris: International Institute for Educational Planning, 1999).

sions, grade homework, tutor students needing additional help, and promote parent involvement can all contribute to increased student achievement.<sup>29</sup> Teachers' use of out-of-class time can have an important impact on the quality of their teaching, student performance, and community support.

It was expected that school administrators would maximize their use of the most highly trained teachers so that those teachers with more training would teach more hours per week. It was further expected that greater amounts of preservice training would reflect a higher commitment to teaching as a career, and, consequently, teachers with more preservice training would devote more of their out-of-classroom time to lesson preparation and other school-related activities.<sup>30</sup> However, based on the previous research about the impact of training on teachers' classroom practices, it was anticipated that no differences would be observed among groups of teachers in their allocation of in-class instructional time.

### Methodology

This study was conducted as a secondary analysis of data collected as part of a larger project to strengthen the management of ethnic minority education.<sup>31</sup> One component of that larger project was the design and pilot implementation of a Teacher Information System Survey (TISS). As part of the pilot data collection, data on a wide range of personal and professional issues were collected from 2,357 teachers in four counties identified as having high ethnic minority populations. These teacher data form the basis of the present study.

This study represents one of the first international efforts to collect questionnaire data from teachers in ethnic minority regions of China. Data collection across this population presents some special challenges. Rural teachers have little experience and considerable reluctance to provide personal information. This constrained the type of questions that could be included on the questionnaire. The questionnaire avoided items that asked respondents to make judgments, express opinions, or evaluate features of the education system or the quality of their own work life. Instead, questions focused on more objective aspects of time use, conditions of service, and personal demographics. At one level, the use of low-inference items can be viewed as a strategy to improve validity. However, it also meant that potentially interesting aspects of teachers' work life and job performance could not be investigated.

Data on time in and out of class were collected through teachers' self-reports. While the use of self-report data posed some threats to validity, it

<sup>29</sup> Ibid.

<sup>30</sup> D. W. Chapman, C. W. Snyder, Jr., and S. Burchfield, "Teacher Incentives in the Third World," *Teacher and Teacher Education* 9, no. 3 (1993): 301-16.

<sup>31</sup> Chapman and Postiglione.

represented a necessary tool within the context in which this study was conducted. Two reasons support the use of self-report data. First, there is little history or experience with classroom-level research in rural ethnic minority regions of China. Classroom observations would be highly reactive and suspect. Second, previous classroom research in developing country contexts indicates there is as much or more within teacher variability across observations as there is variability across teachers.<sup>32</sup> To improve validity, classroom observation studies require multiple observations per teacher.<sup>33</sup> Multiple observations, in turn, have severe implications for logistics and cost. Given the intrusiveness, reactivity, high cost, and potentially low validity of observations, classroom observations were judged to be inappropriate. The authors judged the external validity of collecting data from over 2,300 teachers to outweigh the risks of limitations of instrument validity associated with the self-report.

Another concern in the use of questionnaires is the threat to external validity if the response rate is low. This risk was minimal in the present study. Since the study was part of a formal initiative of the State Education Commission, there was a high degree of monitoring by county education officials, and over 95 percent of all teachers in the target grade levels and target counties completed the survey. The authors suggest that, given the limitations on instrument validity, significant differences among groups represent a conservative estimate of true differences in teachers' use of time.

The dependent variable in this study was the amount of teachers' pre-service training. Respondents were grouped into four categories, based on the amount of their preservice training: junior secondary, senior secondary, secondary normal, or short-cycle normal (a teacher training course roughly equivalent to an associate degree in the United States).<sup>34</sup> The independent variables used to operationalize teachers' out-of-classroom use of professional time and their allocation of in-classroom instructional time are presented in tables 2 and 3.

The teachers participating in this study were selected through a three-stage sampling procedure. The State Education Commission selected four provinces as pilot sites for the TISS based on the prominence of their ethnic minority population and their geographical diversity within the country. The Provincial Education Commission (PEC) within each of the four provinces

<sup>32</sup> B. Fuller, C. W. Snyder, Jr., D. W. Chapman, and H. Hua, "Explaining Variation in Teaching Practices: Effects of State Policy, Teacher Background, and Curricula in Southern Africa," *Teaching and Teacher Education* 10, no. 2 (1994): 141–56; Chapman, Snyder, and Burchfield; Anderson, Ryan, and Shapiro (n. 8 above).

<sup>33</sup> Anderson, Ryan, and Shapiro.

<sup>34</sup> Short-cycle normal training programs are run by nondegree-granting institutions called *jiaoyu xueyuan* (education institutes). These institutes are under the education department and usually have a variety of part-time teacher education courses for practicing teachers who want to upgrade their qualifications. A school teacher who never had any teacher training but had attained the academic standard necessary to teach in primary or secondary school would attend these education institutes.

TABLE 2  
DISCRIMINANT ANALYSIS OF TEACHERS' USE OF OVERALL PROFESSIONAL TIME BY GRADE LEVEL TAUGHT

	Primary Grade 3 (N = 885)		Final Year Primary (N = 751)		Second Year of Lower Secondary (N = 442)		Discriminant Function Coefficient		Item to Function Correlation	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	Function 1	Function 2	Function 1	Function 2
	Over the Last Month, How Much Time Have You Allocated to the Following Activities?									
Minutes per week spent preparing for lessons	102.9	47.48	104.7	49.44	107.0	57.46	-.22	.05	.75	-.64
Hours per week spent correcting students' homework	9.98	7.60	9.72	5.95	9.14	8.01	.06	-.06	.14	.01
Hours spent per week (outside of class) giving individual tutorials	4.91	4.17	4.82	4.05	4.47	4.71	.08	.01	.12	.04
Number of times spent visiting parents of students	17.35	15.82	19.19	15.44	9.49	10.13	.64	.78	.64	.78
Number of hours of class taught do you teach each week?	12.88	6.65	10.61	5.09	9.32	4.13	.73	-.67	.73	-.67
Group centroids:										
Primary, grade 3							.27	-.12		
Primary, final year							-.01	.20		
Second year, lower secondary							-.56	-.11		

NOTE.—Function 1:  $F_1 = .258; \chi^2 = 231.33, P < .001$ ; function 2:  $F_2 = 1.49; \chi^2 = 45.15; P < .001$ ; SD = standard deviation.

TABLE 3  
DISCRIMINANT ANALYSIS OF TEACHERS' ALLOCATION OF CLASSROOM TIME BY GRADE LEVEL TAUGHT

The Last Time You Were in the Classroom, How Many Minutes Did You Have Students Spend on Each of the Following Activities?	Primary Grade 3 (N = 931)		Final Year Primary (N = 807)		Second Year of Lower Secondary (N = 539)		Discriminant Function Coefficient		Item to Function Correlation	
	$\bar{X}$	SD	$\bar{X}$	SD	Function 1	Function 2	Function 1	Function 2	Function 1	Function 2
	Reading texts aloud	3.63	2.75	3.29	2.87	3.31	3.60	.88	.50	-.04
Time doing class exercises	6.13	3.78	6.32	3.81	5.75	4.42	1.15	.35	-.09	-.16
Time for other things	.61	1.37	.62	1.24	.69	1.53	.51	-.02	.04	-.04
Silent reading	2.67	2.24	2.44	2.34	2.51	2.64	.71	.37	-.01	.36
Listening to teacher	14.43	5.26	14.69	5.08	18.50	7.32	2.24	.34	.49	-.26
Group work Activities	2.56	3.11	2.25	2.63	2.40	4.05	1.11	.50	.00	.35
(hands and head)	3.19	2.85	3.36	3.25	3.02	3.76	.98	.01	-.06	1.18
Asking questions	3.45	2.02	3.54	2.18	3.73	2.61	.75	.05	.08	-.16
Maintaining discipline	1.04	1.11	.86	1.06	.82	1.44	.37	.53	.08	.56
Talking about other things	.89	1.36	.70	1.05	.60	1.16	.35	.52	-.12	.56
Reviewing	3.21	2.09	3.43	2.25	3.64	2.46	.85	-.17	.10	-.36
Group centroids:										
Primary, grade 3										.13
Primary, final year										-.15
Second year, lower secondary										1.06
										-.01

NOTE.—Function 1:  $R_1 = .51; \chi^2 = 718.95; P < .001$ ; function 2:  $R_2 = .12; \chi^2 = 34.18; P < .001$ ; SD = standard deviation.

selected one county as the TISS pilot site. Again, the emphasis was on selecting counties that had high concentrations of ethnic minority populations. A brief profile of the four counties represented in this study is provided below.

Ranhuang County is located in the middle of the grasslands of the Inner Mongolia Autonomous Region. This region spans 4,960 square kilometers, with a total population of 28,000, of whom 63 percent are Mongol and the rest composed of Hui, Man, Daur, Tibetan, and Tu minorities, as well as Han (the ethnic majority group in the PRC). There are 11 primary schools, two comprehensive secondary schools, one senior secondary school, and one vocational senior secondary school in the county. School enrollments across the county include 2,746 students at primary, 1,517 students at junior secondary, and 330 students at the senior secondary levels. The schools employ a total of 553 teachers and administrative staff. This county is noted for being relatively advanced in its universalization of basic education.

Xide County is a Yi nationality autonomous county, which is divided into five parts with 31 townships and 169 villages. The largely rural population of 125,249 is spread across an area of 2,207 square kilometers. The Yi constitute 83 percent of the population. Other ethnic groups in the county include the Han (16 percent), Tibetan, Bai, Miao, Zhuang, Buyi, Tujia, Man, and Lisu. The county includes 90 primary schools, 10 junior secondary schools, and one senior secondary school. Enrollments included 12,020 at primary, 1,869 at junior secondary, and 365 at senior secondary levels.

Luocheng County is located in the mountainous western areas of Guangxi Zhuang Autonomous Region. It covers 2,643 square kilometers and contains 140 villages organized into 13 townships. The population totals 348,197 million people, of whom 40 percent are Zhuang, 29 percent are Han, and 30 percent are Mulao. The rest of the population is composed of Yao, Miao, Dong, Baonan, Hui, and Shui. The county has 154 primary schools and 400 "teaching points," or one-room school houses, together serving 4,835 students. There are 17 junior secondary schools with 10,635 students, three senior secondary schools with 1,600 students, and one senior vocational secondary school with 420 students. There are a total of 2,612 government and 997 substitute teachers in the county, 1,882 at the primary, 230 at the junior secondary, and 82 at the senior secondary levels. There is also one in-service teacher training institution.

Heqing county is located in northwest Yunnan province and has a population of 231,000, including Bai, Han, Yi, Lisu, Miao, Hui, Naxi, Tibetan, Zhuang, and Dai, as well as other smaller groups. The Bai are the dominant group, comprising 56 percent of the population. There are 402 primary schools with 32,389 students, 10 junior secondary schools with 7,210 students, and three senior secondary schools with 1,428 students. Heqing was among the first counties in Yunnan province to achieve 6 years of compulsory education.

Within each county, teachers at three grade levels were asked to complete the survey, as follows: (1) those teaching grade 3, (2) those teaching the highest grade level in their primary school (either grade 5 or grade 6, depending on the school), and (3) those teaching the second grade level of junior secondary school (either grade 7 or grade 8, depending on the school). Grade 3 teachers were selected because this is the highest grade typically offered in satellite schools and the last grade at which students have the same teacher for the full day. The last grade of primary school was selected because students take a provincial test at this grade. The external monitoring introduced at this point in the schooling process was thought to be a factor in teachers' motivation and, consequently, in their instructional practices. The second grade level in junior secondary was selected because it was anticipated that students entering a junior secondary school from a variety of different feeder primary schools would need time to settle into the secondary school experience and that instructional practices would be more stable by the students' second year in junior secondary.

The TISS questionnaires were distributed to and later collected from the target teachers by County Education Commission staff. Completing surveys that inquired about their professional backgrounds and current teaching practices was a new experience for most of the teachers. To minimize suspicion and help ensure usable data, the county staff members involved in data collection attended a half-day training session conducted by members of the Beijing-based Chinese and American research team to ensure they could answer teachers' questions about the purpose of the study and about how to complete the questionnaires. County education staff did data entry of completed questionnaires, and the resulting data files were forwarded to the research team in Beijing. The Beijing-based research team cleaned the data files to eliminate missing and out-of-range data. A total of 2,357 teachers across the four counties completed the TISS questionnaire.

The data analysis was conducted in three phases. In phase 1, discriminant analysis was used to test the significance of differences in allocation of overall professional time and in-class instructional time across teachers at the three grade levels. If there were no differences among grade levels, the data from all teachers could be combined in the subsequent analysis of possible differences due to preservice training. If significant differences were detected, it would indicate the need to conduct separate analyses by grade level. In phase 2, the significance of differences among teacher groups in their out-of-class use of professional time was tested using discriminant analysis. In phase 3, the significance of differences among teacher groups in their in-classroom use of professional time was tested using discriminant analysis. In both phases 2 and 3, teachers with secondary-normal training were overrepresented in the overall sample. To better meet the assumptions of the analysis, a 30 percent random sample of these teachers was selected

for inclusion in the discriminant analysis. *T*-tests comparing group means on each variable indicated that this subsample did not differ from the full group on any of the variables entered into the analysis. Since group sizes were still not equal, the prior probability of group size was set to the initial group size in each of the analyses.

## Results

### *Differences across Grade Levels*

The discriminant analysis to test differences in overall allocation of professional time among teachers at different grade levels yielded two statistically significant functions that together accounted for 8.9 percent of the variation in use of time (table 2). Primary discrimination on the first function was between primary and junior secondary teachers ( $R_c = .258$ ;  $\chi^2 = 231.33$ ;  $P < .001$ ). Primary discrimination on the second function was between teachers at the final year of primary and both other teacher groups (grades 3 and 6/7) ( $R_c = .149$ ;  $\chi^2 = 45.15$ ;  $P < .001$ ). Across the three grade levels, teachers at grade 3 taught the most hours per week. In the successively higher grade levels, teachers spent fewer hours per week teaching, less time correcting student homework, less time tutoring individual students, and less time visiting students' parents. In general, it appears that teachers in grade 3 spend more time working than do those at the junior secondary level. Teachers teaching the final year of primary school spent more time visiting parents than did teachers in either of the other groups.

Teachers across the three grade levels also differed significantly in their allocation of in-class instructional time (table 3). While the discriminant analysis yielded two significant functions, which together accounted for 27.4 percent of the variation in teaching practices, most of the variance (26 percent) was explained by the first function. The maximum separation on this first function was between primary and junior secondary teachers ( $R_c = .51$ ;  $\chi^2 = 718.95$ ;  $P < .001$ ). Junior secondary students spent more time listening to the teacher than did students at the primary level, suggesting that junior secondary classrooms were more teacher centered.

The main discrimination on the second function ( $R_c = .12$ ;  $\chi^2 = 34.18$ ;  $P < .001$ ) was between teachers at grade 3 and those at grade 5/6. Grade 5/6 teachers used more class activities, spent more time having students read aloud, and had students spend more time in group work, spent more time maintaining discipline, and spent more class time talking about other things. In general, the difference in activities appears to reflect the greater developmental maturity and base knowledge of the older children. However, the magnitude of these differences between the two levels of primary school teachers was too small to have meaningful implications for practice.

The significance (and magnitude) of the differences in overall use of professional time and allocation of in-class instructional time indicated that



the subsequent tests of differences across teachers grouped by amount of preservice training needed to be analyzed separately by grade level.

*Preservice Training and Teachers' Use of Overall Professional Time*

Grade 3 teachers report working about 30 hours a week. In a typical week, grade 3 teachers spent about 1.75 hours preparing lessons, about 13 hours actually teaching class, 10 hours correcting homework, and about 5 hours tutoring individual students. In addition, they visit about 17 parents per week. The workload is slightly more modest at the junior secondary level. Teachers at this level report working about 25 hours per week, with most of the difference due to fewer hours spent actually teaching class (9.3 hours) and a corresponding drop in time spent correcting homework (9.14 hours). Average time by task for each of the three grades is reported in tables 2 and 3.

*Grade 3.*—The discriminant analysis yielded one significant function ( $R_c = .287$ ;  $\chi^2 = 51.18$ ;  $P < .001$ ; table 4). The amount of preservice training teachers had received accounted for 8.2 percent of the variation in teachers' out-of-class use of time in support of instruction. Primary discrimination was between those who had received preservice teacher training and those who had not, with the greatest difference between the teacher group with the least training and the teacher group with the most. Teachers who had completed some form of teacher training spent more time each week preparing their lessons but less time actually teaching. On average, teachers with upper secondary education taught 45 percent longer than teachers who had completed a short-cycle teacher training program. On the other hand, teachers with the most teacher training spent more time in lesson preparation and somewhat more time tutoring individual students.

*Grade 5/6.*—At grade 5/6, the differences between groups were less dramatic, but the pattern was generally the same (table 5). The discriminating analysis yielded one significant function ( $R_c = .18$ ;  $\chi^2 = 54.92$ ;  $P < .01$ ). The amount of preservice training teachers had received accounted for only about 3.2 percent of the variation in their out-of-classroom behavior. Again, the main difference was that teachers with less preservice preparation taught more hours per week than teachers with more training. That is, teachers with only a junior secondary education taught an average of 14.5 hours per week, compared to teachers who completed secondary teacher training (10.3 hours per week) or short-cycle teacher training (11 hours per week).

*Grade 6/7.*—Differences in out-of-school instructional behaviors disappeared by the second year of junior secondary. No significant differences in out-of-class practices were observed among groups of teachers who differed in their preservice training.

*Preservice Training and Teachers' Allocation of In-Class Time*

*The use of instructional time in ethnic minority schools in China.*—Table 6 reports the average amounts of time teachers allocate to different in-class

TABLE 4  
DISCRIMINANT ANALYSIS OF GRADE 3 TEACHERS' OUT-OF-CLASSROOM INSTRUCTIONAL PRACTICES BY LEVEL OF PRESERVICE TEACHER TRAINING

	Lower Secondary (N = 124)		Upper Secondary (N = 161)		Secondary Normal (N = 155)		Short-Cycle Normal (N = 42)		Discriminant Function Coefficient Function 1	Item to Function Correlation Function 1
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD		
Over the Last Month, How Much Time Have You Allocated to the Following Activities?										
Minutes per week spent preparing for lessons	92.19	45.46	97.74	44.47	108.4	42.23	110.7	50.82	-.42	-.49
Hours per week spent correcting students' homework	8.57	5.32	10.39	7.91	9.81	7.74	10.40	7.99	-.06	-.06
Hours spent per week (outside of class) giving individual tutorials	4.27	2.90	4.70	3.84	4.75	3.51	5.74	3.29	-.18	-.24
Number of times spent visiting parents of students	15.86	12.24	16.90	15.62	18.19	15.00	15.38	13.15	-.08	-.09
Number of hours of class taught do you teach each week?	14.55	6.76	15.55	8.12	11.84	5.80	10.71	4.79	.86	.87
Group centroids:										
Lower secondary										.21
Upper secondary										.27
Secondary normal										-.31
Short-cycle normal										-.50

Note.—Function 1:  $R_c = .287$ ,  $\chi^2 = 51.18$ ;  $P < .001$ ; SD = standard deviation.

TABLE 5  
DISCRIMINANT ANALYSIS OF GRADE 5/6 TEACHERS' OUT-OF-CLASSROOM INSTRUCTIONAL PRACTICES BY LEVEL OF PRESERVICE TEACHER TRAINING

	Lower Secondary (N = 30)		Upper Secondary (N = 128)		Secondary Normal (N = 156)		Short-Cycle Normal (N = 41)		Discriminant Function Coefficient Function I	Item to Function Correlation Function I
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD		
Over the Last Month, How Much Time Have You Allocated to the Following Activities?										
Minutes per week spent preparing for lessons	106.3	34.81	103.8	49.98	103.4	54.92	97.93	46.92	-.15	-.03
Hours per week spent correcting students' homework	11.23	5.20	9.77	6.03	9.97	6.05	11.41	6.86	.40	.38
Hours spent per week (outside of class) giving individual tutorials	4.70	3.64	4.78	4.78	4.41	3.94	5.41	4.05	-.09	.02
Number of times spent visiting parents of students	17.43	18.44	18.16	15.23	17.58	14.55	16.49	13.34	-.16	.09
Number of hours of class taught do you teach each week?	14.53	6.44	11.04	4.52	9.97	4.37	10.90	5.05	.92	.91
Group centroids:										
Lower secondary										.81
Upper secondary										.02
Secondary normal										-.19
Short-cycle normal										.07

NOTE.—Function 1:  $R^2 = .26$ ;  $\chi^2 = 29.70$ ;  $p < .001$ ; SD = standard deviation.

TABLE 6  
 AVERAGE TIME GRADE 3 TEACHERS SPEND ON SELECTED CLASSROOM INSTRUCTIONAL PRACTICES  
 BY LEVEL OF PRE-SERVICE TEACHER TRAINING

The Last Time You Were in the Classroom, How Many Minutes Did You Have Students Spend on Each of the Following Activities?	Lower Secondary (N = 137)		Upper Secondary (N = 184)		Secondary Normal (N = 168)		Short-Cycle Normal (N = 44)	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Reading texts aloud	4.08	2.81	3.87	2.53	3.42	2.39	3.50	2.92
Time doing class exercises	5.89	3.57	6.10	3.47	6.14	3.94	5.93	3.72
Time for other things	.88	1.91	.51	.95	.63	1.46	.68	1.54
Silent reading	2.96	2.43	2.94	2.16	2.51	1.99	2.98	2.94
Listening to teacher	11.80	6.26	11.55	5.31	11.32	4.88	11.30	4.19
Group work	2.16	2.07	2.44	2.56	2.73	3.41	3.16	3.64
Activities (hands and head)	3.07	2.81	3.14	2.58	3.11	2.79	3.11	3.57
Asking questions	3.31	2.16	3.74	2.02	3.71	2.08	2.68	1.85
Maintaining discipline	1.15	1.27	.98	.89	1.02	1.08	.80	.82
Talking about other things	1.07	1.42	.83	1.03	1.05	1.58	.89	1.38
Reviewing	3.02	2.10	2.95	1.72	3.15	2.18	3.27	1.66

Note.—SD = Standard deviation.

activities. If the average utilization of class time at grade 3 were compressed into a single 45-minute class session, students would spend about 15 minutes listening to the teacher present content and cover the lesson material, 10 minutes responding to teacher questions or engaged in group work, 7 minutes reading silently or aloud, and about 6.3 minutes on discipline, talking about other things, and reviewing earlier material.

*Grade 3.*—No significant differences in use of instructional time were detected among grade 3 teachers with different amounts of preservice training.

*Grade 5/6.*—Statistically significant and meaningful differences in teachers' in-classroom instructional behaviors were observed at grades 5/6 (table 7). The discriminant analysis yielded two significant functions, which together accounted for 16 percent of the variation in classroom practices across teacher groups. Primary discrimination on the first function ( $R_c = .309$ ;  $\chi^2 = 73.10$ ;  $P < .001$ ) was between the two groups of teachers with secondary education and those with either less than secondary or more than secondary (short-cycle normal). Teachers with the least preservice preparation and the most preservice preparation had students spend more time working on classroom projects, working in groups, and reviewing course material. Their students spent less time listening to the teacher or doing class exercises.

Primary discrimination on the second function ( $R_c = .265$ ;  $\chi^2 = 36.00$ ;  $P < .02$ ) was between teachers with the least (junior secondary) and the most (short-cycle normal) preservice education. Teachers with only junior secondary training spent more time having students read aloud, read silently from the texts, and do class exercises. Conversely, teachers who completed the short-cycle training program allocated less time to students reading silently, reading aloud, or doing class exercises. The time saved doing less of those activities appears to have been used for more participatory student learning activities.

*Grade 6/7.*—No significant differences in use of instructional time were detected among teacher groups at the junior secondary level. One possible reason, however, is that at the junior secondary level, virtually all teachers had completed secondary schooling. There were no teachers with only a junior secondary preparation. Consequently, there was less range in the total amount of schooling teachers had received across the three teacher groups in the analysis.

### Discussion

This study found potentially important differences in teachers' use of both classroom instructional time and overall professional time across grade levels in ethnic minority areas of rural China. Over a quarter of the variation in classroom practices and about 9 percent of the variation in the use of profes-

TABLE 7  
DISCRIMINANT ANALYSIS OF GRADE 5-6 TEACHERS' IN-CLASSROOM INSTRUCTIONAL PRACTICES BY LEVEL OF PRESERVICE TEACHER TRAINING

The Last Time You Were in the Classroom, How Many Minutes Did You Have Students Spend on Each of the Following Activities?	Lower Secondary (N = 32)		Upper Secondary (N = 141)		Secondary Normal (N = 166)		Short-Cycle Normal (N = 46)		Discriminant Coefficient		Item to Function Correlation	
	X	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	Function 1	Function 2	Function 1	Function 2
Reading texts aloud	4.56	3.06	3.23	2.54	3.39	3.06	3.00	3.26	.82	.79	.08	.42
Time doing class exercises	7.09	3.66	6.26	3.36	6.15	3.57	4.76	3.70	.67	1.24	-.22	.51
Time for other things	.41	.84	.79	1.87	.51	1.22	.63	1.25	.25	.15	-.05	-.07
Silent reading	3.25	2.36	2.82	3.13	2.36	2.08	2.09	2.36	.51	.74	-.02	.42
Listening to teacher	13.75	4.43	14.52	5.08	15.14	4.51	14.13	5.18	1.03	.58	-.23	.13
Group work Activities	2.25	2.76	2.10	2.82	2.04	2.85	3.17	3.79	.94	.38	.33	-.20
(hands and head)	3.41	2.43	3.13	3.01	3.22	3.39	5.13	4.97	1.28	.27	.49	-.35
Asking questions	3.75	1.90	3.71	2.26	3.51	2.22	3.76	1.99	.58	.36	.10	.04
Maintaining discipline	1.00	2.27	.87	1.03	.83	.96	.94	.98	.30	.26	.13	.07
Talking about other things	.53	.84	.70	1.05	.73	1.09	.74	.98	.12	.15	-.06	-.18
Reviewing	3.47	2.36	3.28	2.19	3.19	2.32	4.04	2.63	.96	.15	.33	-.14
Group centroids:												
Lower secondary									.53	.77		
Upper secondary									-.13	-.05		
Secondary normal									-.19	-.07		
Short-cycle normal									.71	-.45		

NOTE.—Function 1:  $R = .309$ ;  $\chi^2 = 73.10$ ;  $P < .001$ ; function 2:  $R = .265$ ;  $\chi^2 = 36.00$ ;  $P < .02$ ; SD = Standard deviation.

TABLE 8  
SUMMARY OF AMOUNT OF VARIANCE EXPLAINED

	Use of Overall Professional Time (%)	Allocation of In-Class Instructional Time (%)
Differences among grade levels	8.9	27.4
Differences among teachers at grade 3	8.2	N.S.
Differences among teachers at grade 5/6	6.8	16.0
Differences among teachers at grade 6/7	N.S.	N.S.

NOTE.—N.S. = not significant.

sional time were associated with the grade level at which teachers taught. The context in which teachers taught appeared to have a meaningful impact on the instructional practices they used and, to a lesser degree, on the use of their professional time.

Among teachers with different amounts of preservice training, the study consistently found statistically significant but relatively small differences in their overall allocation of professional time and in their allocation of in-class instructional time at the primary level (table 8). The difference disappears at the junior secondary level. The main source of difference among teacher groups was in the amount of time spent in lesson preparation and in actual teaching. At both grades 3 and 5/6, those with more preservice training spent more time in lesson preparation but less time actually teaching. Indeed, teachers with the least preservice preparation taught the most hours; teachers with the most training taught the least.

More training was related significantly to less teaching. At one level, this finding seems counterintuitive, as one might expect schools to make maximum use of those teachers best prepared as teachers. One possibility is that those with no training are willing to take on a heavier teaching load in the hope that this will increase the likelihood of their being sent for training and upgrading in the future. A second possibility is that those with more training are in better schools that are not as understaffed, while those with less training are in poorer understaffed schools. Neither of these possibilities is particularly persuasive. The magnitude and pervasiveness of the differences in teaching loads is greater than what might be expected by individual teachers for additional teacher training. Moreover, while better trained teachers seem more likely to be assigned to better schools, it does not necessarily follow that enrollment pressures in the better schools are less than in poorer schools so that teachers in better schools do not need to work as hard. Indeed, some international evidence suggests that demand for basic education is quality sensitive; that is, as quality goes up, parents demand more education (though the basis parents use in judging quality differs widely).

A third alternative, and perhaps the most compelling possibility, is that teachers with more training enjoy a higher standing in the school and have more influence over their own teaching schedules than do teachers with weaker credentials. While this finding raises a question about the return on the investment in preservice training, it is consistent with the work-life hypothesis theory.<sup>35</sup> This hypothesis posits that teachers (like most of the rest of us) tend to operate in ways that reduce the complexity of their work lives. In the present case, teachers with more training use their increased status to secure a lower workload or to accrue other benefits. For example, better trained teachers allocated more out-of-class time to private tutoring, which is generally a source of supplemental income. While it is not surprising that parents would want better trained teachers as tutors for their children, it does call into question the public return on the investment in teacher training.

Differences in classroom practices differed notably across grade levels. Instruction became progressively more teacher centered with the progression of grades. Grade 3 students spent more time doing class projects, reading aloud, and being subjected to classroom discipline. Older students (grades 5/6, 6/7) spent more time listening to the teacher talk.

Contrasts in the allocation of in-class instructional time among teachers grouped by level of training indicated only small differences but in a pattern that supports the value of preservice training. In general, better trained teachers tended to use less teacher-centered practices (than their less prepared colleagues). This effect was strongest at the primary level and disappeared by the junior secondary level. Students in the classes taught by teachers with more preservice training spent less time listening to the teacher talk and reading, silently or aloud. They spent more time doing group work, practical activities, and conversing about topics indirectly related to the immediate lesson.

While preservice training appears to make a small difference, the pattern of behaviors differentiating teacher groups was based more on differences in the overall amount of preservice education they had received than in differences between those with and without teacher training. That is, differences among teacher groups had more to do with the overall amount of prior education than whether or not the teacher had specifically received preservice training. For example, teachers with secondary education and those with secondary teacher training did not allocate overall professional time or classroom instructional time in significantly different ways. In short, the amount of teachers' prior education seems to make a difference in their professional behavior, but the amount of specialized teacher training does not, at least in the primary grades. By junior secondary, even those differ-

<sup>35</sup> Snyder (n. 12 above); Chapman and Snyder, "Teachers' Beliefs about Effective Teaching" (n. 1 above).



ences seem to disappear. At grades 6/7 (junior secondary), the amount of preservice training teachers had received had no significant association with teachers' allocation of overall professional time or of in-class instructional time. One possible reason was that there was less range in the amount of teachers' prior training at this level—for example, there were no teachers with only junior secondary education.

A key policy question, then, is why preservice training does not have more impact on practice. Five reasons may contribute to an explanation.<sup>36</sup> First, teacher training may not adequately model new practices. Trainees may be introduced to such techniques as small group work, practical exercises, and questioning techniques, but may not have practiced these different techniques enough to feel confident about using them in their own classrooms. For example, in rural minority areas of China, the distances from the teacher training colleges to the teaching practice schools may be quite far. This means that the trainee spends most of his or her time there without supervision. The teaching supervisor from the teacher training school makes overnight visits to the village schools, but this process is not ideal, since the communities vary a great deal, and often neither the trainee nor the supervisor is very familiar with them.

Second, the introduction of virtually any new instructional practice increases the complexity of a teachers' work life. Even practices that are demonstrably effective in raising student achievement or simplifying classroom teaching in the long term (e.g., new textbooks, new teaching aids) may carry short-term costs (the need to learn new material, additional class preparation) that teachers are unwilling to incur.

Third, new instructional practices that teachers learned during preservice training may run counter to their beliefs about effective teaching. When this occurs, teachers quickly abandon those practices they regard as inappropriate and resume teaching behavior they regard as acceptable. Since teacher training schools provide only an introduction to bilingual education techniques, graduates may ignore some of what they learned there and resort to using techniques that make more sense to them but that are monolingual.

Fourth, teachers may lack support from principals, peers, parents, and often the students themselves for the introduction of new classroom practices or ways of allocating their time. Classrooms have been described as "sticky organizations," in which teacher practice operates in tight conformity to a community notion of what constitutes good teaching. Recent research in Botswana found, for example, that even teachers who held widely

<sup>36</sup> D. W. Chapman, "Improving Instructional Practice: The Teachers' Dilemma," chap. 14 in *School Effectiveness and Learning Achievement at Primary Stage*, ed. National Council of Research and Training (New Delhi: National Council of Research and Training, 1995), pp. 325–44.

variant attitudes and beliefs about what constituted effective teaching had similar instructional practices.<sup>37</sup>

Fifth, schools and classrooms lack the resources teachers need to implement a wider variety of instructional behaviors. If practices introduced during teacher training assume students have a sufficient supply of textbooks or that teachers have access to teaching aids (maps, science paraphernalia) that are not available in the schools to which they are ultimately assigned, these teachers may abandon those teaching practices as impractical. In China, teacher training institutions are generally equipped with state-of-the-art computers. However, many village schools are fortunate if they have blackboards.

Most often, teachers are caught in a convergence of these factors. New graduates from teacher training schools have limited confidence in their own ability to employ new teaching practices, find little peer or community support for the introduction of those practices, and lack easy access to materials. Although the cost of implementing new practices is immediate, clear, and personal, the benefits are less clear. They choose not to adopt these practices. Nonetheless, understanding the underlying reasons is essential when formulating an appropriate solution. The central issue is whether teachers lack the essential knowledge and skills or whether they have the skills but do not feel they can implement them due to social and material barriers within the schools. If the issue were barriers, fixing teacher training would only waste further resources; if the issue were training, interventions to change the school climate would be wasted.

Results of this study need to be understood within a larger context. Not all differences between trained and untrained teachers show up in this type of analysis. Teaching is not a technical transaction in which discrete teacher behaviors trigger specific student responses. Indeed, education systems are made up of large numbers of low probability events that may impact a child.<sup>38</sup> Effective teaching is best understood as a strategy in which teachers have a repertoire of pedagogical skills from which they draw, depending on the situation.<sup>39</sup> Nonetheless, teacher training in China, as in the rest of the world, gives considerable emphasis to the development of pedagogical skills. It is reasonable to expect that teachers with greater training would use their classroom and their professional time in different ways.

<sup>37</sup> P. D. Perry, D. W. Chapman, and C. W. Snyder, Jr., "Quality of Teacher Worklife and Classroom Practice in Botswana," *International Journal of Educational Development* 15, no. 2 (1995): 115–25; Fuller et al.

<sup>38</sup> C. W. Snyder, Jr., and D. W. Chapman, "Strategic Planning in a Mess," working paper (Harvard Institute for International Development, Cambridge, Mass., 1999).

<sup>39</sup> R. J. Shavelson, "Review of Research on Teachers' Pedagogical Judgments, Decisions, and Behavior," *Elementary School Journal* 83, no. 4 (1983): 392–413; R. J. Shavelson and P. Stern, "Research on Teachers' Pedagogical Thoughts, Judgments, Decisions, and Behavior," *Review of Educational Research* 51 (1981): 455–98; C. M. Clark and R. J. Yinger, "Teachers' Thinking," in *Research on Teaching: Concepts, Findings, and Implications*, ed. P. Peterson and H. J. Walberg (Berkeley, Calif.: McCutchan, 1979), pp. 231–63.

This study examines the extent to which teachers with different amounts of preservice training differed in their allocation of in-class instructional time or in their use of overall professional time. The study yielded four main findings: (1) There were substantial differences in teachers' instructional practices and allocation of professional time among grade levels. (2) Within the lower grade levels, there were small but significant differences in teachers' use of instructional time and in the allocation of overall professional time among teachers who differed in the amount of preservice training they had received, but these differences tended to disappear by the junior secondary level. (3) The main difference across the analysis was that more training was associated with less teaching. For example, at grades 5 and 6, teachers with only a junior secondary preparation taught 40 percent more than teachers who completed college. This pattern was interpreted within the work life complexity framework—teachers with more training had higher status, which they used to secure a lower workload. (4) The differences in teachers' professional behaviors were based more on differences in the overall amount of training rather than the specific nature of the training (teacher training vs. regular academic training).

The purpose of this study was to examine the policy implications of China's investment in teacher training as a mechanism for improving education quality. As with earlier studies of the impact of teacher training, findings were promising but still problematic. Teachers with more preservice training did exhibit desirable patterns within their pedagogical behavior. Results indicated that preservice training of teachers teaching in ethnic minority areas of China does make some difference, but not much. While differences in teachers' allocation of professional time were not large, these findings are consistent with research on teacher training in other countries. Are these differences substantial enough to justify China's considerable investment in teacher training? Ultimately, that is a decision to be made by the Ministry of Education. However, findings suggest that teacher training programs are making a small but positive contribution to China's efforts to upgrade basic education in ethnic minority areas.

Appendix Table A1

TEACHER PREPARATION CURRICULUM FOR TONGREN MINORITY NORMAL SCHOOL IN GUIZHOU PROVINCE (1996–1997) (Reported in Hours per Week)

Program Subject	Year 1			Year 2			Year 3	
	Regular	Remote	Pre-school	Regular	Remote	Pre-school	Regular	Remote
Ideological education	2	2	2	2	2	2	2	2
Chinese language and literature	5	5	4	5	5	5	3	3
Language and literature: Teaching materials and methods	...	...	...	...	...	...	2	2
Mathematics: Teaching materials and methods	...	...	...	...	...	...	2	3
Mathematics	5	5	4	4	5	4	2	...
Physics	2	...	2	2	...	...	...	...
Chemistry	2	...	2	2	...	...	...	...
Biology and personal hygiene	3	2	4	...	...	...	...	...
Psychology	2	2	2	...	...	...	...	...
Study of education	...	...	...	2	2	2	2	2
History	...	...	...	2	...	2	2	...
Geography	...	...	...	2	...	2	2	...
Physical education	2	2	2	2	2	2	2	2
Art	2	...	2	2	1	2	2	...
Music	2	1	3	2	...	4	2	...
Teacher's spoken language	...	...	...	2	2	2	...	...
Dance	...	...	2	...	...	2	...	...
Major courses for music teachers	...	12	...	...	11	...	...	14
Major courses for art teachers	...	11	...	...	12	...	...	14
Major courses for physical education teachers	...	13	...	...	13	...	...	14
Labor	...	...	...	...	...	...	2	...
Elective course(s)	2	1	1	2	2	2	5	4
Total hours (depending on elective course selection)	29	31	30	32	32	31	30	32

(Continued)

**Appendix Table A1** (*Continued*)

Program Subject	Year 1	Year 2	Year 3
Also required of all students:			
Calligraphy	1	...	1
Shape building	1	...	...
Audio-visual education	...	...	1
Use of computers	...	...	1
Toddler counting (preschool teachers only)	...	...	...
Elective courses:			
Applied country-style composition	...	...	...
Knowledge about nationalities	...	...	...
Applied country-style art	...	...	...
Modern science and technology	...	...	...
Dance	...	...	...
Celebrities in education	...	...	...
Painting and appreciation	...	2	...
Writing	...	2	...
Calculation	...	2	...
Painting and writing	...	...	...
Common knowledge about home appliances	...	...	...
Applied chemistry	...	2	...
Local history	...	2	...
Law	...	2	...
Agricultural meteorology	...	...	2
English	...	2	2
Calligraphy	...	2	...
Primary school common knowledge about nature	...	...	2
Children's literature	...	...	2
Applied law	...	...	2
Multigrade teaching techniques	...	...	2

SOURCE.—Tongren Minority Normal School.