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# EVALUATION TOOL OF QUALITY CONTROL FOR WESTERN CHINA RURAL TEACHER: A COMPETENCY PERSPECTIVE

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## SUMMARY

***Background:*** *Rural education in Western China facing many severe problems, among these, rural teacher quality control has sparked extensive debate; however, the previous study involved less on how to evaluate these rural teachers and how to develop the evaluating standard.*

***Subjects and methods:*** *To get around this issue, the current identified the competency model of Western China rural teacher and developed an evaluation tool for them.*

***Results:*** *Following the protocol of developing a measurement, we interviewed 22 rural teachers in Western China, and conducted two rounds of surveys in western rural areas (n=116/n=208), ran Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA), figured out the key competencies of Western China rural teacher. The evaluation tool for this kind of teacher consists of three factors: professional cognition, student education and guidance, and basic skills. The reliability and validity of the evaluation tool were verified.*

***Conclusions:*** *Our work may contribute to rural education in Western China.*

***Key words:*** *western China rural teacher - quality control - competency model - evaluation tool - evaluation standard*

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## INTRODUCTION

Experiences of teacher quality control that target developing countries' rural area have sparked global debate. Historically, rural basic education has been referred as the "not forgotten but not valued enough" for public and policy makers (Meier & Edington 1983). However, more than 50% of school districts are considered as the rural education both in U.S. and mainland China (Reagan et al. 2019). Meanwhile, "education for all" need to solve the problems of the difference between urban and rural education. Students from rural communities tend to incapably accept inequitable admission opportunities, lower appropriate funds and less high-quality teachers who is willing to live in rural areas (Yarrow et al. 1999). Among these, teacher education and quality control become a crucial issue, given that rural teacher's quality determines the development of education in rural communities and students' academic performance, etc. (Rearden & Bertling 2019).

As rural education has grown in importance, rural teacher's quality has become a rising concern. Rural teacher's quality draws a greater awareness in teacher education (Corbett 2016), especially in developing countries, rural education faces various problems, e.g., parents are lack of interests in education, government's insufficient funding, limited resources, ineffective education outcome and underqualified teachers (du Plessis & Mestry 2019). Corresponding to those, teacher's wage, working condition are consistent with their performance and students' achievement (Hanushek & Rivkin 2007). Moreover, evidence shows that teacher's pre-service training and professional development training are not related to teacher's productivity, but the working experience will promote student's achievement (Harris & Sass 2007). On the contrary, teacher in rural areas get qualified pre-service training, but the retention time and teaching experience are deficient.

Since there are various problems in rural teachers, reasonable evaluation and quality assurance mechanism become the necessary conditions for actual management. Although we can provide system-wide policies and enabling environment to control and improve rural teacher quality (Villegas-Reimers 2003), but there is still a gap between environment arrangement and quality control, for example, even after some training programs, some rural teacher is not motivated (Robinson & Yi 2008), and have low subjective well-being(SWB) (Tang 2018).

The competency perspective may fill the gap between theoretical ideology and actual situation. The competency concept was proposed by (McClelland 1973), referring that competency is a collection of several key attributes. Henceforth, to construct a competency model is helpful to guide individual career development (Enz & Siguaw 2000). Moreover, the competency model will help to guide, measure and rectify professional performance (Noe 2008). In this paper, we try to develop the targeted standard from competency perspective, so that we can formulate the qualified standards for Western China rural teacher, and provide standard comparison and quality control.

## BACKGROUND AND THEORETICAL FRAMEWORK

### Rural teacher quality in Western China context

Western China rural education and its teacher has changed dramatically along with China's economic development and social stratification. "During the late 1990s, China moved from a period of 'wealth creation' that benefited the majority of the population to a period of 'wealth concentration' that benefited a minority" (Biao & Shen 2009). What is more serious is that, economic development in the west is not as good as that in the eastern coastal areas. Hence, Western China's rural education is facing severe challenges. Rural teacher quality is gradually attracting attention, for instance, poor professional self-development awareness, low level of teacher resource, lack of scientific research ability and psychological problems (Liu 2017).

In order to improve teacher quality, Western China's rural education has been reformed in many aspects, but shows insignificant effect. The public and policy makers realized basic education could play the most important role in raising the income of rural family (Schultz 1961). With this academic consensus, the rural education management system started to reform from 2001 to 2004, which the basic education's responsibility was transferred from central government to county, and it seems that the teacher's incentive and rural student's achievement are not benefit from this managerial reformation (Liu et al. 2009). While the educational inequality is intensive from 2000s, "urban priority and urban oriented" is still widespread (Mok et al. 2009). In order to improve the rural Western China's teacher quality, the Rural School Mapping Adjustment (RSMA) policy was carried out from 2001, but the western rural teacher accompanied with several problems, for instance, low quality relationship between teacher and parents, increasing dissatisfaction from young graduates, etc. (Rao & Ye 2016).

How to improve rural teacher's quality and how to evaluate them in line with the actual situation of rural area has become rarely involved research field. At present, there are numerous studies to prove the important role of improving teacher quality; it is regarded as the key determinant for students' literacy skills, academic achievement, behaviors, etc. (Rowe 2003). Darling-Hammond (2000) proposes that state policy may make an important difference by regarding teacher education, licensing, hiring and professional development, while Borman & Kimball (2005) prove most students' academic performance is positively correlated with the quality of teachers. Higher level of teachers' quality will have positive impact on student learning and national economic growth (Hanushek 2012), and it can also infer that teacher-student interaction will affect the mobility of high-quality teacher (Goldhaber et al. 2011). From above, we can hold that the improvement and measurement of teachers' quality is not only related to external policies and employment environment, but also closely related to teaching factors such as emotional fluctuation and teacher-student interaction.

To develop an evaluation tool for teacher quality control is a matter that needs to take into account a variety of internal and external factors. In view of the current research gap, we try to develop one competency model, which can identify the core competencies of Western China rural teacher. We conducted the research according to the protocol of developing measurement. We interviewed rural teachers from different regions in Western China to identify the core competencies, so that developed one scale based on those competencies, and developed the survey questionnaire to validate the scale. During this process, we try our best to ensure that the evaluation criteria for Western China rural teacher involves all aspects inside and outside the school, but to be concise and appropriate.

### Developing a competency model for evaluating Western China rural teacher

After McClelland firstly put forward the concept of competency in 1973, researchers have carried out many beneficial explorations. The competency, include achievement motivation, personality traits, self-concept, career attitude and behavioral skill, which is essential to individual's success (Spencer & Spencer 1983). Some scholars also consider personality traits are the core of competence, which can lead high performance (Boyatzis 1983). In terms of individual's professional improvement, there are several core competencies decide the motivation, e.g., life value, knowledge system and practical skill, etc. (Friesen & Anderson 2004). Moreover, competency could also be associated with learning and knowledge process; it is a process that knowledge and competencies, learning design and delivery models are constructed in an integrated framework (Gilbert et al. 2006). It implies that a competency model can explain individual learning and work performance.

For Western China rural teacher, their competency meaning is to examine whether these teachers get the exact qualification that meet the actual work of Western China. Asame & Wakrim (2017) argued that a competency model is a set of personal characteristics, including working skills, professional knowledge and career attitude, etc., which will meet the requirement of actual work. Therefore, when we want to develop a Western China rural teacher's competency model, as mentioned above, we suppose the competency model should be different from urban teacher or coastal area. There are some mature competency models for different occupations, for instance, Chinese family firm's manager model, which is suitable for specific companies (Zhong & Shi 2007), and managing multiple projects model, which is designed for specific industries (Patanakul & Milosevic 2008). The model we want to develop is for evaluating and controlling the quality of Western China rural teacher.

The competency model for Western China rural teacher has its unique characteristics, given that the special working environment and career requirement. As we discussed before, Western China's basic education is lag behind the urban and coastal area, there are unbalanced development of regional education, and there is a significant divergence between rural and urban students in terms of intellectual & physiological development, meanwhile, high quality teachers are the minority in rural areas.

Considering the actual situation of rural education and the professional particularity of teaching career, with the interview materials, we assume that the main aspects of high-quality rural teacher should possess are as follows. As rural teacher in Western China, they should know working environment in rural community is worse than urban, the teacher-parent interaction may not easily compare with urban parents, students are different because of their imperfect growth environment, but as a teacher, caring for students and improving teaching skills must possess no matter in any region.

## Key factors of Western China rural teacher's competency

As we thought before, rural teacher in Western China must obtain the idea that rural education faces multiple difficulties, but there are some key factors that must be stressed. For the key factors of professional competency, some researchers already defined with various points. Machado et al. (2015) believe that key factors of competency can be applied in a more general sense for everyday life, and should be competent in a context for a certain function. Machado's research indicates that the key factors of rural teacher in Western China should take fully consideration of special situation of rural basic education. In addition, key factors are also regarded as the role that meet the demand of organization or task (Gagné et al. 1997), and key factors are also defined as knowledge, skill, ethic, and independent judgement (Parkinson & Chew 2016). Similarly, Ron (2004) also affirm the key factors of competence are skill, knowledge and attitude. From above research, the key factors should fulfill the requirement of specific working context and focus on knowledge, skill and personal attitude. Since we focus on rural high-quality teachers in Western China, based on the previous literature review and our interview conceptualization, we assume that the key factors for Western China rural teachers are as follows, professional cognition, basic skills and student education & guidance.

### *Professional cognition*

As an education practitioner, it is quite necessary to learn normal education, educational concept and history, and basic rural education knowledge. At the early stage of education development, the government controlled the recruitment of teacher, and the normal student education were supported by public finance. Nevertheless, with the reform of managerial system and economic development, the free-market implementation and social stratification lead rural education to become disadvantaged part, unfortunately, this situation still exists (Murphy 2009). The main challenge for Western China rural education is the value conflict between professional ethics and the pursuit of improving personal quality of life (Wang & Gao 2013). Therefore, as a rural teacher in Western China, a rational and objective understanding of the problem of unfair education and the backward situation of rural education and life is the prerequisite for qualified teachers. Meanwhile, all the teachers should soberly realize that improving student performance is the uppermost priority because the utilitarian purpose of basic education in current China is to help student get further higher-grade education (Zhang et al. 2019).

### *Basic skills*

The basic skill is a rich connotation domain that include educational management, student and class management, professional skill, etc. based on our interview material. First, rural teacher needs to recognize the difference between rural culture and urban culture and manage to balance this difference (Zhao & Fu 2018). Secondly, common sense of management, during our interview, most rural teachers were all mentioned that how to manage the students and learn rural education's managerial system were very important for their work. This point of view is also supported by previous research, for example, better teacher-student, teacher-parent, teacher-teacher, teacher-educational administrator relationship is essential for student academic performance(Wang et al. 2019; Zhao & Parolin 2014). In addition, Education reform and information education are also being carried out, it requires the rural teacher keep learning new educational means and methods (Zhao et al. 2008).

### *Student education & guidance*

We may divide the education & guidance into two aspects, A, the common sense for all teachers, to educate students to understand the society objectively, form correct outlook on life values, and develop sound personality and fine nature; B, the special challenge for Western China rural teachers, students with special background in rural China. For instance, value the male child only(Hannum et al. 2009), left-behind children from farmer-workers' family(Wei et al. 2020), mental retardation students (Li et al. 2019) are ubiquitous. For rural teachers, the special situation of rural education is not involved in the teacher training, but a major challenge for them to carry out teaching work. In most cases, rural teacher's role is not only the lecturer, but also the guarantor to coordinate the relationship between all parties and ensure the students' further education. From this point of view, rural teachers shoulder more responsibility, which has a more

important impact on students' academic performance and personal characteristics. It is also suggested that high-qualified teacher will prevent low-achieving performance (Donald et al. 2005).

## METHODOLOGY AND RESULTS

In the previous section, we have discussed the grim situation of rural teacher quality in Western China, and outlined the core characteristics of Western China rural education, defined the key factors of competency model. To operationalize the Western China rural teacher's model and contribute to the rural education, we develop the evaluating standards for rural teacher in Western China, as seen below. With the recommendation of Churchill (1979) and Hinkin (1998), our research took a three-session procedure to develop the evaluating standards. First, from the semi-interview material and the literature review, we generated the initial idem pool and prepared the first version of scale. Second, we conducted the first round of survey, which included the first version of scale, and we then did item reduction so that formed one more accurate version of scale. Third, we conducted the second round of survey, which include the accurate scale, and we evaluated the reliability and validity.

### Item generation and filtering

We conducted a series of semi-structured interviews with 22 rural teachers, who work in Western China basic education, to generate the initial item pool. These 22 rural teachers are all come from western province of China, including 4 in Chongqing, 5 in Sichuan, 2 in Shaanxi, 2 in Gansu, 2 in Guangxi, 3 in Yunnan, 1 in Ningxia, 1 in Inner-Mongolia, 2 in Guizhou. Their average age is 34.7 (SD=7.8) and their average tenure is 12 years (SD=8.6). Among these 22 rural teachers, 72.8% of them received a bachelor's degree, 13.6% of them received a master's degree, and 13.6% of them only have associate degree.

All of the interviewees were required to answer the semi-structure interview outline according to their practical work experience, what they learned from their experience, and how to become a high-quality rural teacher, what's their opinion about the current rural education, and their reflection on teacher training, etc. In order to get more information, we also conducted the Behavior Event Interview (BEI).

We identified several subjects that related to rural teacher's competency by using text analysis techniques. According to our theoretical framework, the text analyzing subjects were clustered into three domains, which were the aforementioned three factors, professional cognition, basic skills and student education & guidance. Based on these three domains, we developed the item pool for Western China rural teacher's core competencies, and adding items retrieved from interview material and previous literature. Table 1 reveals the initial item pool, with defined three most crucial subjects.

After identifying these three critical subjects and generating the initial item pool, we needed to filter the appropriate items for competency model. Hence, we invited 10 rural teachers who worked in Western China to evaluate our initial items, and these 10 teachers were not involved in the interview before so that we can do a content adequacy test. The evaluators were required to assess the relevance and significance of each item to the main subject, and gave content evaluation and expression refining of items.

Finally, nine items were eliminated during this process, for the following reasons: the item was not suitable or not well defined in Western China context; the item had no relevant of being a rural basic education teacher; the item was not important to rural teacher's practical work; the item was beyond the capacity of most rural teachers.

**Table 1.** Initial item pool

| Item | Source | Remained |
|---|---|---|
| 1. As teacher, I pay attention to open up students' vision and cultivate their life ideal. | L | Yes |
| 2. I will focus on left-behind, one-parent family, and diffident student. | I | Yes |
| 3. I actively encourage students to develop their sound personality and good character. | I&L | Yes |
| 4. I will teach students to understand the society objectively and establish a correct outlook on life values. | L | Yes |
| 5. The theoretical and practical knowledge is of equal importance. | I&L | Yes |
| 6. Learning from front-line teachers with rich teaching experience is a good way to improve myself. | I&L | No |
| 7. I get tired sometimes, so something like "soul soother" works for me. | I | Yes |
| 8. The idea of school leadership is very important to a school. | I&L | No |
| 9. Home school connection and students' family background has great influence on their performance. | I&L | Yes |
| 10. I lay stress on the study and application of education laws and regulations. | I | Yes |
| 11. I believe teacher should follow up students' mental health, if condition permission, psychological consultation room can be set up. | I | Yes |

| | | |
|---|---|---|
| 12. As teacher, I am strict with students, supervise and urge them to improve their academic performance. | I&L | Yes |
| 13. Students' performance and personal safety are equally important. | L | Yes |
| 14. I always concern about student's mood. | I&L | Yes |
| 15. The ability of organization, planning and communication is the basic skill that qualified teachers should possess. | I&L | No |
| 16. As teacher, I will organize the teaching content and lesson design in a planned, organized and logical way. | I&L | No |
| 17. Stress tolerance and crisis management are the essential qualities of excellent teachers. | I | Yes |
| 18. As teacher, I evaluate students' performance reasonably and justly. | L | No |
| 19. As teacher, I actively adjust their own mentality and keep teaching enthusiasm. | I&L | Yes |
| 20. As teacher, I actively learn the knowledge and skills related to teaching. | I&L | Yes |
| 21. Improving students' achievement is the most important thing for teacher. | I&L | Yes |
| 22. As teacher, I take care of students in a proper way, instead of taking themselves as nannies. | I&L | Yes |
| 23. Teaching is not only a career, but also need dedication. | I | Yes |
| 24. Communicating reasonably with parents and refusing unreasonable demands of parents. | I | No |
| 25. I carefully select students' test papers and other teaching materials. | I&L | No |
| 26. As teacher, I fully understand the current education in urban and rural areas. | I | Yes |
| 27. I can treat education unfairness rationally. | I | Yes |
| 28. Beside my main subject, I will learn more about the basic knowledge of other disciplines. | I&L | No |
| 29. In teaching practice, the knowledge of pedagogy and psychology is very important. | L | No |

Note: The Column *Source* means where the item collected, Interview (I) or Literature review (L) or collected from both of these two ways (I&L). The column *Remained* means whether the item should be remained (Yes) or not (No) after the content adequacy test.

## Initial item reduction and evaluation

Based on the previous step and participant's interview information, we developed the questionnaire. In our questionnaire, a 5-point Likert-type format was adopted for items, ranging from 1=strongly disagree to 5=strongly agree. The survey was administrated in Chongqing, a southwest city in Western China, and the questionnaire was distributed to nine western provinces by WeChat (a widely used smartphone application), email, and website. All the targeted rural teachers participated voluntarily and the participants' information were kept confidential. For this round of survey, 126 rural teachers completed the questionnaire effectively, with a valid rate at 92.1%. Among these rural teachers, 87.1% were female, 97.4% of them were Han people (China's main group). Their age ranged from 20 to 60, 87.1% of them were under the age of 40, 81.9% of them were not graduated from top-tier universities in China. All of these rural teachers had more one-year work experience in Western China, their teaching courses involve various subjects of current rural basic education. Note that our research goal is to develop the evaluation tool for Western China rural teachers; we required all the participants should work in rural basic education and answer the questionnaire according to their own actual work experience.

After collecting the data, we use SPSS Statistics24.0 to run Exploratory Factor Analysis (EFA), adopting the principal factor analysis to extract factors and using the varimax approach to rotate. The Kaiser-Meyer-Olkin (KMO) coefficients was 0.933, and the Bartlett's test of sphericity was significant, which indicate it was suitable for factor analysis. According to eigenvalue criterion in conjunction with a scree plot, three factors were emerged and total variance explained rate was 82.81%. The criteria to exclude one item was as follows: factors loading was less than 0.50 and the cross-loading was more than 0.50. Hence, seven items were excluded after checking the rotated component matrix. Table 2 shows the results of EFA, showing the factor loading of remained items.

Factor I contains the skills and requirements for teaching, as rural teacher in Western China, self-learning ability, educational management, professional skill etc. are all essential for them, which will help rural teacher to have basic qualified skills, thus, we term this factor as *Basic Skills*. Factor II points to the reality of rural students, given that the students in rural area are suffering several problems, for instance, the high dropout rate in rural areas, the problem of left behind children, etc. The rural teachers need to cultivate students' life ideal and broaden their view. Factor II is named as *Student Education and Guidance*. Factor III is something for rural teacher's interior quality; they should have sober cognition of rural-urban education,

and adjust themselves well. Therefore, we name Factor III as *Professional Cognition*.

Meanwhile, we also estimated the internal consistency. The Cronbach's alpha coefficient for Factor I is 0.962, Factor II is 0.974, and Factor III is 0.726. The overall Cronbach's alpha coefficient is 0.955. These results indicate that the scale is reliable.

Finally, we did the confirmatory factor analysis (CFA). With the result of EFA, we use AMOS 24 to construct the model: three factors belonged to the main factor, the competency model for Western China rural teacher. Each factor, *Basic Skills, Student Education and Guidance*, *Professional Cognition* has several items. According to the result of CFA, the model fits our sample very well: $X^2 = 84.202,\ df = 51,\ X^2/df = 1.651$; comparative fit index (CFI)=0.981; and root mean square error of approximation (RMSEA)=0.075. Figure 1 demonstrates the standardized weights of these items on the belonging factors.

**Table 2.** Factor loading of explorative factor analysis

| Item | I | II | III |
|---|---|---|---|
| 10. I lay stress on the study and application of education laws and regulations. | 0.775 | 0.421 | 0.219 |
| 5. The theoretical and practical knowledge is of equal importance. | 0.764 | 0.433 | 0.304 |
| 9. Home school connection and students' family background has great influence on their performance. | 0.761 | 0.483 | 0.237 |
| 13. Students' performance and personal safety are equally important. | 0.758 | 0.364 | 0.274 |
| 19. As teacher, I actively adjust their own mentality and keep teaching enthusiasm. | 0.725 | 0.450 | 0.329 |
| 20. As teacher, I actively learn the knowledge and skills related to teaching. | 0.723 | 0.476 | 0.324 |
| 4. I will teach students to understand the society objectively and establish a correct outlook on life values. | 0.418 | 0.852 | 0.170 |
| 3. I actively encourage students to develop their sound personality and good character. | 0.461 | 0.837 | 0.176 |
| 1. As teacher, I pay attention to open up students' vision and cultivate their life ideal. | 0.451 | 0.830 | 0.116 |
| 2. I will focus on left-behind, one-parent family, and diffident student. | 0.393 | 0.828 | 0.223 |
| 7. I get tired sometimes, so something like "soul soother" works for me. | 0.285 | 0.019 | 0.779 |
| 21. Improving students' achievement is the most important thing for teacher. | 0.045 | 0.387 | 0.778 |
| 26. As teacher, I fully understand the current education in urban and rural areas. | 0.355 | 0.097 | 0.695 |

Note: Factor I is named as *Basic Skills (BS)*; Factor II is named as *Student Education & Guidance (EG)*; and Factor III is named as *Professional Cognition (PG).*

## Replication

Even though our first round of survey's data provided some evidence that the measurement of Western China rural teacher's competency model was valid and reliable, for further proof and as the previous literature suggested, we did replication.

This was our second round of survey, the questionnaire was distributed again, and the participants were required to be different from the first round. As replication in similar situations, different participants can exclude the influence of different places or schools, which verifies the robustness of our competency model. All participants were voluntary, and their personal information & answer were confidential. For this round of survey, 226 rural teachers completed the questionnaire effectively, with a valid rate at 92.0%. Among these rural teachers, 87.0% were female, 97.6% of them were Han people. Their age ranged from 20 to 60, 87.0% of them were under the age of 40, 81.7% of them were graduated from non-key universities. Like the first round of survey, all of these rural teachers had more one-year work experience in Western China, their teaching courses involve various subjects of current rural basic education.

After getting this round of survey data, we also did the CFA to verify the construct validity. The hypothetical model was the same as we described before, which showed good fit ($X^2 = 83.084,\ df = 62,\ X^2/df = 1.340$, CFI=0.991, NFI=0.966, NNFI=0.989, RMSEA=0.041). Figure 1 depicts each item's weight on the belonging factor.

In order to make the comparison, we also developed the alternative models: (A) one-factor model, all the items belong to one factor ($X^2 = 241.520,\ df = 65,\ X^2/df = 3.716$, CFI=0.925, NFI=0.900, NNFI=0.910, RMSEA=0.115); (B1) two-factors model, *Professional Cognition and Student Education & Guidance* belong to the first factor, *Basic Skills* as the second factor ($X^2 = 126.587,\ df = 64,\ X^2/df = 1.978$, CFI=0.973, NFI=0.928, NNFI=0.963, RMSEA=0.069); (B2) two-factors model, *Professional Cognition and Basic Skills* belong to the first factor, *Student Education & Guidance* as the second factor ($X^2 = 90.033,\ df = 64,\ X^2/df = 1.407$, CFI=0.989, NFI=0.963, NNFI=0.986, RMSEA=0.044); (B3) two-factors model, *Basic Skills and Student Education & Guidance* belong to the first factor, *Professional Cognition* as the second

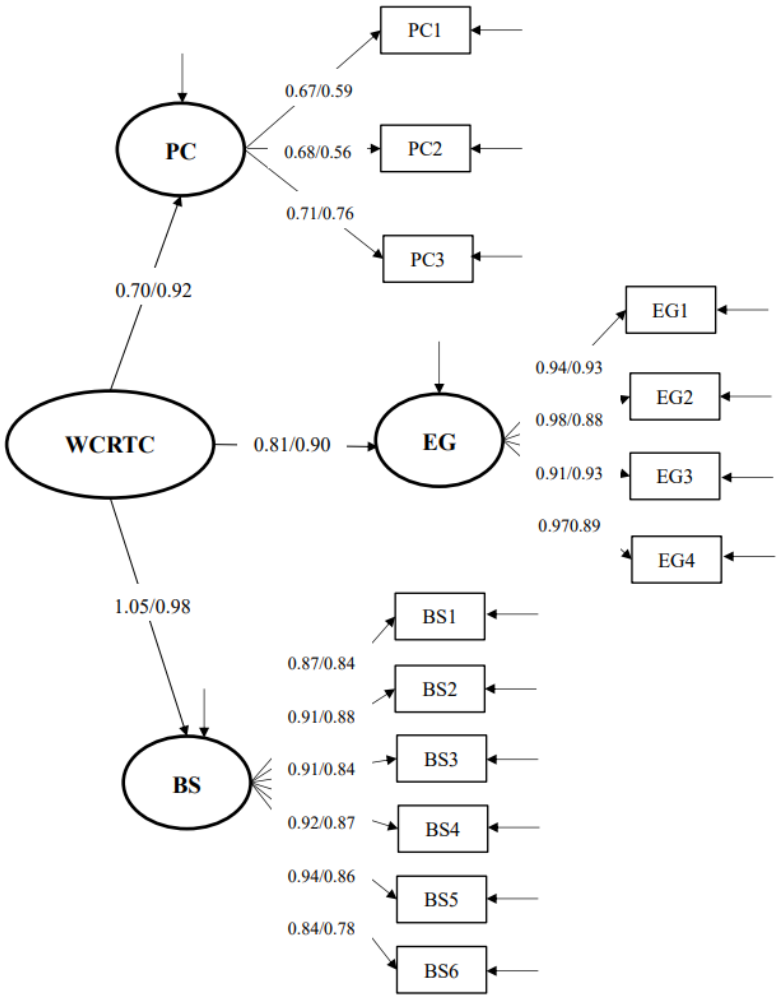
factor ( $X^2 = 232.662,\ df = 64,\ X^2/df = 3.635$, CFI=0.928, NFI=0.904, NNFI=0.912, RMSEA=0.113). Among these model's calculation results, as the Table 3 demonstrates that the three-factor model is the best model.

In conclusion, our replicated survey data provide evidence for the reliability and construct validity of this measurement method.

**Table 3.** Goodness-of-Fit Summary

| Model | *df* | $X^2$ | CFI | NFI | NNFI | RMSEA | 90% Confidence interval RMSEA |
|---|---|---|---|---|---|---|---|
| Three-factor model | 62 | 83.084 | 0.991 | 0.966 | 0.989 | 0.041 | 0.010 to 0.062 |
| One-factor model | 65 | 241.520 | 0.925 | 0.900 | 0.910 | 0.115 | 0.099 to 0.130 |
| Two-factor model (B1) | 64 | 126.587 | 0.973 | 0.948 | 0.968 | 0.069 | 0.051 to 0.086 |
| Two-factor model (B2) | 64 | 90.033 | 0.989 | 0.963 | 0.986 | 0.044 | 0.019 to 0.065 |
| Two-factor model (B3) | 64 | 232.662 | 0.928 | 0.904 | 0.912 | 0.113 | 0.097 to 0.129 |

Note: N=208. NFI=normal fit index; NNFI=nonnormal fit index; CFI=comparative fit index; EMSEA=root mean squared error of approximation.




Note: WCRTC=*Western China Rural Teacher Competency*; PC=*Professional Cognition*; EG=*Student Education and Guidance*; BS=*Basic Skills*; the first/second number on the path is the weight calculated based on the data of the first/second round of survey (N=116/208).

**Figure 1.** Structure of Western China rural teacher's competency

## DISCUSSION AND CONCLUSION

For a quite long time, researchers on Western China rural education focused on policy- making, teacher quality and student academic achievement, rural basic education and national economic growth & human capital development (Brock 2009; Chen et al. 2019; Li et al. 2019). Some researchers noticed the close relationship between the quality of rural teachers and educational development, students' academic performance (Wang et al., 2020), some also proposed the new way to improve rural teacher's quality and intended to change the inequality of education between rural and urban areas (Robinson 2008). In most cases, Western China rural teacher's quality is largely depended on the Free Teacher Education Program (FTEP) for the pre-service training and National Training Program & Provincial Training Program for the in-service training, however, the above training program is not designed for rural teacher, even not for Western China. We agree that it is quite necessary to develop the quality control standard from competency perspective, and guide the in-service training if possible. We follow the protocol of competency model development, which based on the actual situation of Western China's real rural education; we apply the rural teacher's practical needs in the actual rural school environment.

Our study follows the protocol proposed by previous scholars (Churchill 1979; Hinkin 1998) to identify the core competencies of Western China rural teacher and develops the evaluation tool for rural teacher. Our measurement is in the light of real working environment of rural school; it includes three main factors, that is, *Professional Cognition, Student Education and Guidance, Basic Skills*. These three factors will play an important role in the work activities and career development of rural teachers.

Note that our interviewees and participants are all rural teachers, and all of them have more than one year work experience in rural school. Their age distribution, teaching subjects, politic countenance, gender, pre-service experience, nationality are the typical feature of Western China rural teacher. Yet, according to our interview, we notice that they are still full of uncertainty about their own work, and are full of doubts about the development of their own profession and the improvement of teaching quality. Therefore, based on the actual investigation of Western China rural education and the development of evaluation tools is particularly urgent, especially the educational reformation and rural education's higher expectation emerged (Vinovskis 2016).

As we mentioned above, three factors of the competency model are the main evaluation standard for Western China rural teacher. The *Professional Cognition* includes the recognition of China's current education, the purpose of utilitarian education, emotional cognition and psychological regulation; the *Student Education and Guidance* is regarded as one teacher's qualification of basic purpose of education, including the cultivation of student's life ideal, personality and life value; the *Basic Skills* is stressed by both managerial department and school administrator, in terms of Western China's practical situation, it includes theoretical and practical knowledge, rural education characteristics, and educational law acknowledgement. All these three factors can be considered as the requirement of rural teachers' quality management and the standard of measurement & evaluation.

This study has some theoretical contributions. First, it followed the standard protocol of evaluation & measurement tool developing. This measurement grasps the core competencies of Western China rural teacher; this is a new evaluation tool that has rarely touched by other researchers. Given its reliability and validity, further research about rural teacher evaluation and management may take our measurement as a tool to analyze and explore more rural education research topic. Second, it may help to design targeted and practical evaluation decision system. Since our evaluation tool is developed based on the actual rural educational situation, the main problem of Western China rural education research is lacking of practical research, but focus on "office research". The current research could shed light on the improvement of teacher qualification's requirement design, and promote theoretical research of rural education.

The result can also contribute to the Western China rural educational practice. First, it may help the educational managerial department and normal university to establish a better training program based on our measurement, both for pre-service and in-service rural teacher. Second, the current rural teacher-training concept does not satisfy the actual needs of rural education, our study may help to revise this unsuitable concept. Third, with the guidance of key competencies for rural teacher, the study can also help the rural education policy-makers (Gandrud & O'Keeffe 2016) to revise rural education preferential policy, funding policy, teacher quality improvement policy.

Our research also has some limitations, which we will improve in further research. First, we should do a follow-up research design and collect data to observe the actual application effect of the evaluation tool. Through this procedure, the external validity of our research can be further confirmed. Second, this evaluation tool is only designed for Western China rural teacher, and it can only apply to the work setting of Western China. Rural teachers in other areas of mainland China or outside China, may have different core competencies.

In conclusion, this study identified the core competencies of rural teachers in Western China, and used it as an evaluation tool to improve the quality of rural teachers. Our work can contribute to the optimization design of rural teacher training program, provide a new perspective for the quality control of

rural teachers, and provide reference for the professional development of rural teachers in Western China.

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### Conflict of interest:

*None to declare.*

### Contribution of individual authors:

Boyang Zheng: the corresponding author who is responsible for the analysis and processing of data and participates in the writing of the paper.

Guiping Sun: is responsible for the overall design of the research and the writing of the paper.

Yan Wu: is mainly responsible for the collection and interview of research data.

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