

Original article

Living conditions, working conditions, professional development and self-identity in Chinese rural primary school teachers: A chain-mediating model

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Abstract:

The mobility of rural teachers has a significant influence on education quality, while teachers' self-identity plays a significant role in their mobility. This study investigates the factors affecting rural teachers' self-identity through a chain-mediating model, aiming to enhance their self-identity, improve teachers' retention and promote teaching quality. Teachers' self-identity impacts whether they are willing to stay in rural areas and become teachers, highlighting their identification with the rural areas; meanwhile, their professional identity influences whether teachers are willing to become teachers in rural schools, emphasising recognition of the rural school. Working conditions in rural schools and the living conditions in rural areas can have a great impact on rural teachers. This study explored the data of 1,420 rural teachers in an autonomous region in China, China, a typical Chinese rural area, where almost half of primary school teachers are rural teachers. Using structural equation modelling, the data show that living conditions can have positive direct effects on self-identity, and professional development can affect self-identity positively as a mediating variable. Working conditions and professional identity are mediating variables that can have a positive effect on self-identity. However, the relationship between working conditions and professional development is not significant. The policy should promote the development of rural areas, enhance schools' hardware, and provide assistance to teachers to facilitate professional development and ultimately enhance their self-identity.

1. Introduction

In China, it is hoped that rural teachers will stay in rural areas, especially remote rural areas, to improve the quality of rural education. However, the long-term retention of rural teachers is a very complex issue. Teachers' self-identity is related to their retention, professional development and teaching vitality, which means that self-identity cannot be ignored (Ding & Wei, 2024). The quality of teachers is a key factor affecting the quality of rural education, and it is necessary to understand teachers' self-identity as an important concept to understand their work (Mingren & Shiquan, 2018). From the perspective of identity, teachers actively construct their own

roles. Teachers' self-identity affects their work competency, initiative and, to some extent, their mobility (Beauchamp & Thomas, 2009).

Rural teachers' self-identity has emerged as a significant area of research in the field of education globally. Across various countries, the unique challenges and contexts faced by rural educators have drawn attention to the ways in which they perceive themselves professionally and personally. Whether in China or in other countries, the number of teachers who are unwilling to go to rural areas to work or stay is increasing (Jiao & Long, 2020; Willis, 2017). International studies indicate that rural teachers often navigate multifaceted roles, serving not

only as educators but also as community leaders, mentors and advocates (Li & Craig, 2014). Their self-identity is intricately linked to their sense of belonging within their communities and their commitment to addressing the specific needs and aspirations of rural learners (Li & Craig, 2014). Understanding rural teachers' self-identity is crucial, as it not only influences teachers' job satisfaction and commitment, but also plays an important role to maintain sustainable educational development in rural regions.

In China, the number of rural teachers has decreased in the past years. For example, in the past 10 years, from 2014 to 2023, the number of rural teachers in China had been decreased around 31.12%, from 2,115,970 to 1,457,288 [Data from China Statistic Yearbook (2015/2024) at <https://www.stats.gov.cn/sj/ndsj/2015/indexch.htm>, www.stats.gov.cn/sj/ndsj/2024/indexch.htm.] This study seeks to discuss factors influencing rural teachers' self-identity with reference to a specific case. Further, the purpose is to enhance teachers' self-identity as a means to strengthen teachers retention in rural areas, as well as improve the overall teaching quality in these regions.

2. Literature review

According to Giddens (2020), self-identity is a reflexive project, continuously shaped and reshaped by individual's interactions with social environment and their efforts to maintain coherence in their life narrative. Different with static or innate constructs, self-identity is dynamic, shaped by the interplay between social structures and individual agency (Sabaliauskienė, 2024). The key concept which Giddens emphasizes is ontological security, which refers to individual needs psychological stability and identity continuity to main security and navigate daily uncertainties (Kinnvall & Mitzen, 2020). Giddens focuses on reflexivity, which means individual do not accept their experiences passively; instead, individuals consider and explain them actively (Giddens, 2020). In the context of rural teachers, this theoretical framework provides a lens to explore how external circumstance and internal agency contribute to their self-identity construction. The living and working conditions of rural teachers consistently influence and redefine their self-identity (Flores & Day, 2006). Moreover, as rural teachers actively interpret and embrace their experiences, these experiences equally mold their professional identity (how they see themselves as teachers) and exert an influence on their self-identity (how they see themselves as individuals) (Flores & Day, 2006). At the same time, their interactions with the surrounding environment contribute to their professional development, which also influences their self-identity (Flores & Day, 2006).

Scholars usually understand teachers' self-identity as their own perception of who they are and how they understand themselves as teachers. Jersild (1955) suggested that teachers' understanding of themselves was the most important requirement in any effort they made to help students gain healthy self-acceptance. Baumeister and Baumeister & Muraven (1996) contended that identity requires consideration of individual choices and the complex relationships between social and

cultural backgrounds, while Li (2011) asserted that teachers' self-identity is their unique perception of themselves and their relationship to the world around them and that it develops over time during the process of self-development. Xu (2013) argued that teachers' self-identity is a reflective understanding in a particular field based on their experiences and values. Teachers' self-identity is impacted by many factors because they live and work in a social context (Reid, 2017). Much previous research discusses teachers' self-identity through qualitative methodology, as teachers' self-identity originates from teachers' past experiences (Li & Craig, 2014; Reid, 2017). Summarising, the self-identity of teachers is also about their interactions with society and the environment. In this study, the concept of rural teachers' self-identity encompasses their belongings of rural areas, as well as their perception about their contribution to the rural community.

2.1 Rural teachers' living conditions and self-identity

Previous research has shown that rural teachers faced multiple challenges in the past, such as geographical isolation, limited resources, and a lack of professional development opportunities (Downes & Roberts, 2018; Skyhar, 2020). For some rural teachers, respected social status and a simple interpersonal environment are reasons to live in rural areas (Liu & Liu, 2020). However, difficulties remain, including low salary, housing issues and inconvenient transportation (Lu, 2016). Rural teachers' challenges can significantly affect their self-identity and thus affect their job satisfaction (Mingren & Shiquan, 2018). Here, rural teachers' living conditions include physical, social and economic environments where they reside. (Ciftci & Cin, 2018). These conditions encompass access to basic infrastructure, such as housing, transportation (Lu, 2016), healthcare (Michaels-Strasser et al., 2021), as well as opportunities for social engagement and community (Tang et al., 2018).

From Giddens' (2020) perspective, the self is not a fixed entity but is continuously shaped through ongoing reflexive activities. Especially in modern life, individuals have the capacity to adapt and reshape their identities in response to changing circumstances. This adaptability is seen as a crucial aspect of the reflexive project of the self (Giddens, 2020). As individuals' self-identity can be influenced by circumstances, it may differ significantly in a rural education setting. Generally, rural teachers live in their communities, and those interactions can affect their self-identity (Li & Craig, 2014). Poor living condition may lead to reduced motivation, while supportive and stable environments may contribute to a stronger sense of belonging and identity for rural teachers (Ciftci & Cin, 2018). In this study, the living condition is considered as the independent variable influence teachers' self-identity by affecting their daily experiences and perceptions of their professional roles.

H1. Teachers' living conditions have a positive effect on teachers' self-identity.

2.2 Mediating role of working conditions and professional identity between living conditions and self-identity

Working conditions refer to professional environment, resources, school systems, relationships and personnel available to teachers when they perform their roles (Nkambule, 2022). For rural teachers, these include teaching facilities, instructional materials, administrative support and opportunities for collaboration with colleagues (Nkambule, 2022). The quality of working and living conditions can affect rural teachers' mobility significantly (Mingren & Shiquan, 2018). The rural area is considered a special community, and teachers who live in rural areas are considered to be immersed in the community (MacLure, 1993). The overlap between living and working environment is particularly pronounced in rural areas, as teachers often within or nearby the community they serve (Azano et al., 2020). The proximity may blur the boundaries between rural teachers' personal and professional lives, improving the influence from living conditions to working conditions (Corbett, 2007).

H2. Teachers' living conditions have a positive effect on teachers' working conditions.

Professional identity reflects how rural teachers perceive on the relationship between themselves and their professions, including their values, beliefs, skills, behaviors and belongings to their working community (Xu et al., 2023). Rural teachers' working conditions, such as lack of resources or teaching multiple subjects, may contribute to their special professional identity (Monk, 2007). Especially in primary school, due to the lack of teacher resources, one rural teacher needs to be responsible for more than one subject and may change their subject based on the changing requirements of rural education (White, 2008). Professional identity in this study is focused more on whether teachers are qualified for the job of educators, especially in schools. From the view of teachers' professional role, working conditions provide outside resources and support them to complete high-quality educational work.

H3. Teachers' working conditions has a positive effect on teachers' professional identity.

Compared with professional identity, self-identity concerns teachers' sense of belonging in rural community and perception about their contribution to the rural community. In rural areas, teachers' professional identity may be affected by a lack of high-quality working conditions, thereby affecting their self-identity (Karousiou et al., 2019).

H4. Teachers' professional identity has positive effects on teachers' self-identity.

2.3 Mediating role of professional development between living conditions and self-identity

Professional development refers to rural teachers continuously acquire new knowledge, skills, competences to improve their working practices evolving new educational demand (Komba & Mwakabenga, 2019). In rural contexts, professional development can improve teachers' teaching quality, confidence, resilience and commitment, as well as teachers

may face unique challenges (Yan & Li, 2024). Rural teachers' living conditions influence their mobility, and in rural areas generally, the living conditions are less high-quality than in urban areas (Ling et al., 2020). Previous researchers have claimed that the relatively poor living conditions and environment in rural areas may be down to poor economic and cultural factors. From an economic perspective, there may be insufficient economic support for teachers' living condition and insufficient resources for teachers' professional development (Ling et al., 2020). According to Maslow's hierarchy of needs, rural teachers' living condition is their first physiological need; after meeting this requirement, they will consider their self-realisation needs for professional development (Abdulrahman & Hui, 2018). From a cultural perspective, teachers' professional development in rural areas is mainly based on their educational beliefs and self-training (Ling et al., 2020). Without good living conditions and a positive environment, rural teachers find it difficult to develop their self-training.

H5. Teachers' living conditions have positive effects on teachers' professional development.

Rural teachers' professional development is a key factor influencing their teaching ability, quality and confidence; it influences their competency in their job (Liu et al., 2022). Teachers' professional development is different from their pre-job learning and training, requiring teachers to change their roles and recognise their self-identity (Liu et al., 2022). Professional development means that teachers are promoted or have an enhanced teaching ability which could bring a higher salary or make them more confident in their work and life. Rural teachers' self-identity here means that they can have a sense of belonging and make contribution as rural teacher in a rural area. Thus, rural teachers' self-identity cannot be discussed without professional development.

H6. Teachers' professional development positively affects teachers' self-identity.

2.4 Mediating factors' relationship between working conditions and professional development

Rural teachers' working conditions play an important role in their professional development, and both have a strong relationship with education equality (Barrett et al., 2015). Relatively difficult working conditions, such as a lack of resources for teachers' lifelong learning activities, may affect rural teachers' professional development (Li et al., 2023). The vast majority of rural teachers are required to teach two subjects, while many are required to teach three or four (Liu et al., 2017), which puts huge work pressure on them (Lu, 2016). The teachers also have to deal with a lot of administrative and non-teaching work (Liu & Liu, 2020). If rural teachers want professional development, they need the support of their school to get away from excessive administrative and overburdened teaching tasks so that they have time for their development-for example, post-job training. Given the speed of development of teaching content or teaching technology, without enough post-job learning and training it is difficult to guarantee high-quality rural education (Glover et al., 2016).

H7. Teachers' working conditions have positive effects on teachers' professional development.

The main purpose of this study is to explore the relationships among teachers' self-identity, professional identity, professional development, working conditions, and living conditions in the Chinese rural context, and to examine whether teachers' professional identity, working conditions and professional development play mediating roles between teachers' self-identity and living conditions. Based on the literature review, we propose a series of research hypotheses, as shown in Fig. 1.

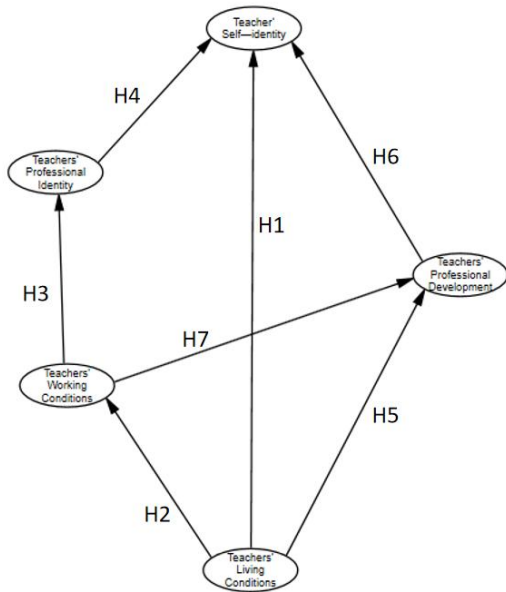


Fig. 1. Hypothesised model.

H1. Teachers' living conditions have positive effects on their self-identity.

H2. Teachers' living conditions have a positive effect on their working conditions.

H3. Teachers' working conditions have a positive effect on their professional identity, and teachers' working conditions are a mediating variable in their living conditions and professional identity. Moreover teachers' working conditions are a mediating variable in their living conditions and professional development.

H4. Teachers' professional identity has positive effects on their self-identity, and teachers' professional identity is a mediating variable in their living conditions and self-identity.

H5. Teachers' living conditions have positive effects on their professional development.

H6. Teachers' professional development has positive effects on their self-identity, and teachers' professional development is a mediating variable in their living conditions and self-identity. Moreover, teachers' professional development is a mediating variable in their working conditions and self-identity.

H7. Teachers' working conditions have positive effects on their professional development.

3. Method

In recruiting teachers for this study, we identified teachers from the National Training Programme during the period from 16 to 28 November 2020. We also asked primary school principals to distribute our questionnaires in rural schools. To achieve a more generalised conclusion, we collected data from rural teachers hailing from diverse regions in an autonomous region, specifically in public rural schools. The questionnaire was distributed across most of southern and northern region. This comprehensive coverage ensures a representative sample for our analysis. Ethical considerations are paramount in our study. We have strictly adhered to voluntary participation, ensuring that teachers freely decide whether to participate. Additionally, our scale is designed to gather demographic information anonymously, ensuring that no sensitive personal details, including teachers' names, are collected. This approach ensures the privacy and confidentiality of the respondents and aligns with ethical standards.

For the questionnaire, the study designed items that align with the definitions for each dimension. For example:

3.1 Sampling and participants

Before distributing the surveys, we obtained approval from the institutional review board at a Normal University. For our quantitative research, we utilised the online platform Wenjuanxing <https://www.wjx.cn/> to disseminate digital surveys in November 2020. Of the 1,550 surveys distributed, we successfully recovered 1,539 (attaining a 99 per cent recovery rate). Due to the electronic scale, as long as the respondents complete and submit the scale, it will be considered completed, resulting in a very high response rate for the questionnaire. However, after eliminating 119 invalid surveys, the effective rate was calculated to be 92.3 per cent, resulting in 1,420 valid surveys to be utilised for the analysis. The criteria for deleting questionnaires are based on the IP addresses and the time taken by respondents to complete the questionnaires, both of which are accessible due to the nature of online questionnaires. Firstly, the research targets rural teachers. Therefore, questionnaires with IP addresses indicating urban locations or unknown origins will be deleted. Secondly, if the time taken to complete the questionnaire is excessively short, for example, less than 30 seconds, the questionnaire will also be deleted, indicating that the respondents did not take the survey seriously. The Cronbach's alpha for the 35-item scale is 0.96. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is 0.97, with a significant Bartlett's test, meaning that the new scale has good quality. A KMO value nearer to 1 indicates that the variables are correlated, making the data suitable for factor analysis. Conversely, a lower value suggests that the variables are uncorrelated, implying the absence of a common influencing factor(Kaiser, 1974).

To ensure the validity of the measures, the overall sample was randomly split into two distinct subsamples. Sample 1, consisting of 732 participants (51.55 per cent of the total), was used for exploratory factor analysis (EFA) with Cronbach's alpha 0.96 and KMO value 0.97 . The purpose of the EFA was to identify and establish the latent factors underlying

Table 1. Example of Items.

Dimension	Example of Iteme
Self-identity	Given my personality, I am suited to be a teacher in a rural area.
Professional Identity	I believe that the efforts of rural teachers are proportional to their rewards.
Professional Development	There are more promotion opportunities in rural schools.
Working Conditions	Rural schools have good educational facilities and complete hardware equipment,
Living Conditions	The housing conditions of rural teachers are relatively good

Table 2. Demographic information.

Dimension	Type	Quantity	Percentage
Gender	Male	450	31.7%
	Female	970	68.3%
Ethnicity	Majority	678	47.7%
	Minority	742	52.3%
Types of Schools	County-level Schools	222	15.7%
	Township Central Schools	540	38.0%
	Village-level Schools	587	41.3%
	Information Deficiency	71	5%
Actual Monthly Income	Below 3000 (yuan)	66	4.6%
	3000-4000 (yuan)	390	27.5%
	4000-5000 (yuan)	555	39.1%
	Above 5000 (yuan)	409	28.8%
Whether Teacher Education Major	Teacher Education Major	1016	71.5%
	Non-Teacher Education Major	404	28.5%
Whether Married	Unmarried	449	31.6%
	Married	97	1 68.4%
Average Age of Teachers		33.3	
Average Duration of Teaching Experience		10.1	

the data. Conversely, Sample 2, comprising 688 participants (48.45 per cent of the total), was designated for confirmatory factor analysis (CFA) with Cronbach's alpha 0.97 and KMO value 0.97. The objective of the CFA was to assess the fitness of the identified factors and confirm the structural validity of the measure. By dividing the sample into two distinct segments, we were able to conduct two separate analyses, ensuring that the factor structures identified through EFA did not unduly sway the outcomes of the CFA. This approach allows CFA to assess objectively the alignment between the factor structures derived from EFA and the results of prior research. Additionally, applying EFA and CFA to different subsamples enables researchers to show clearly how each analysis performs on separate samples, thereby bolstering the study's reliability and credibility.

3.2 Measures

Using SPSS 24, we performed an EFA to identify latent variables within the dataset. Subsequently, in Mplus 7.4, we conducted a CFA to refine the model fit. This iterative process aimed to optimise not only the fit of each individual latent variable but also the overall model fit. The path analysis was completed using AMOS.

Mplus and AMOS are two widely used software tools for structural equation modelling, each capable of conducting a comprehensive analysis independently. In this study, Mplus was initially employed to analyse various components of the equation model, identifying key factors and items. Subsequently, AMOS was used for path analysis. The advantage of Mplus lies in its programmability, which allows swift and straightforward determination of the relationships between factors and items, yielding prompt analytical results. Conversely, AMOS excels in providing an intuitive and rapid means of

plotting the paths that require scrutiny. An additional rationale for choosing AMOS for path analysis is the ease with which it generates path analysis diagrams compared to the more time-consuming adjustments required for Mplus-generated visuals. Therefore, utilising Mplus for equation model analysis and AMOS for path analysis and plotting constitutes a highly efficient approach.

We conducted EFA in SPSS 24 to identify the factors and CFA using Mplus 7.4 to modify the model fit and to optimise the fit of each factor and the model as a whole. Under the process of CFA analysis, Mplus 7.4 was able to provide the modification indices to removal items to calibrate each factor and the overall scale until the structural model fit of each factor and the overall scale were in an acceptable range.

The reason we employed AMOS for path analysis of structural equation modeling in this study is multifaceted. Firstly, AMOS possesses analytical capabilities as powerful as those of MPLUS. Secondly, AMOS offers intuitive visualization tools, significantly reducing the operational complexity of model construction. Thirdly, the analytical results in AMOS are directly represented on the constructed model, facilitating a more straightforward understanding and interpretation of the research findings. Lastly, while MPLUS requires data to undergo preprocessing, AMOS, being integrated into the SPSS software, allows for direct analysis using SPSS data. This integration enables a more flexible and rapid process of model construction, iteration, and result acquisition during model building, and data exploration.

3.2.1 Teachers' self-identity

The measure of teachers' professional identity, initially adapted from Du (2012) and Judge et al. (1998), originally consisted of seven items. These items were rated on a five-point scale ranging from 1 to 5, where 1 indicated "It doesn't completely fit my situation", 2 meant "It doesn't fit my situation", 3 stood for "I'm not sure", 4 represented "It fits my situation", and 5 denoted "It completely fits my situation". Through an EFA with a rotation method applied to Sample 1, the latent structure was one factor. Subsequently, a CFA was conducted using Sample 2 to refine the model. The validation results demonstrated good model fitness, with $\chi^2/DF = 0$, $RMSEA = 0.00$, $CFI = 1$, $TLI = 1$, $SRMR = 0.00$. DF means degree of freedom, $RMSEA$ means the root mean square error of approximation, CFI means the comparative fit index, TLI means the Tucker-Lewis index, and $SRMR$ means the standardized root mean square residual. Consequently, we arrived at a final model with one latent variable represented by three items: Q3, Q7, and Q19.

3.2.2 Teachers' professional identity

The measure of teachers' professional identity, initially derived from a combination of sources including An & Tong (2020), Jian (2017), Lin (2018), Wei (2008), Xu (2007) and Zhou (2019), encompassed nine items. These items were evaluated using a five-point scale ranging from 1 to 5, where 1 denoted "It doesn't completely fit my situation", 2 indicated "It doesn't fit my situation", 3 represented "I'm not sure", 4 signified "It fits my situation", and 5 meant "It completely

fits my situation". Analysis of the data from Sample 1, using an EFA with a rotation method, revealed two possible factors. Building upon this, a CFA was conducted using data from Sample 2 to refine the model. The validation process confirmed one factor with satisfactory model fit, with results indicating $\chi^2/DF = 0.13$, $RMSEA = 0.00$, $CFI = 1$, $TLI = 1$, $SRMR = 0.006$. As a result, a revised model was established with one latent variable represented by four key items: Q10, Q12, Q13 and Q14.

3.2.3 Teachers' professional development

The assessment of teachers' professional development was adapted from various sources, including Fang (2018), Gao et al. (2017), Li & Wang (2018), Lin (2018) and Xu (2007). Initially, it consisted of six items which were evaluated using Lister's five-point scale ranging from 1 to 5, 1 indicating "It doesn't completely fit my situation", 2 indicating "It doesn't fit my situation", 3 indicating "I'm not sure", 4 indicating "It fits my situation", and 5 indicating "It completely fits my situation". Through an EFA with a rotation method applied to Sample 1, the latent structure emerged as a one-factor model. Subsequently, a CFA was conducted using Sample 2 to refine the model. The validation process demonstrated a good model fit, with the following indices: $\chi^2/DF = 0$, $RMSEA = 0.00$, $CFI = 1.00$, $TLI = 1.00$, $SRMR = 0.00$. Finally, the model was refined to include one latent variable with three items: Q20, Q22 and Q33.

3.2.4 Teachers' working conditions

The measurement of teachers' working conditions was adapted from various sources, including Gao et al. (2017), He et al. (2018), Wei (2008), Wu (2022), Zhao & Liu (2018) and Zhou (2019). Initially, it encompassed six items evaluated using Lister's five-point scale ranging from 1 to 5, where 1 indicated "It doesn't completely fit my situation", 2 denoted "It doesn't fit my situation", 3 represented "I'm not sure", 4 signified "It fits my situation", and 5 implied "It completely fits my situation". Through an EFA with a rotation method applied to Sample 1, the latent structure emerged as a one-factor model. Subsequently, a CFA was conducted using Sample 2 to refine the model. The validation process demonstrated a satisfactory model fit, with the following indices: $\chi^2/DF = 0.91$, $RMSEA = 0.08$, $CFI = 0.99$, $TLI = 0.98$, $SRMR = 0.02$. Finally, the model was refined to include one latent variable represented by four items: Q32, Q30, Q41 and Q31.

3.2.5 Teachers' living conditions

The assessment of teachers' living conditions was adapted from multiple sources, including Fang (2018), Ling & Wu (2019), Shi & Wang (2019), Xu & Xu (2020) and Zhao (2019a). Initially, it encompassed seven items, which were evaluated using Lister's five-point scale ranging from 1 to 5, 1 indicating "It doesn't completely fit my situation", 2 indicating "It doesn't fit my situation", 3 indicating "I'm not sure", 4 indicating "It fits my situation", and 5 indicating "It completely fits my situation". An EFA with a rotation method, based on Sample 1, revealed that the latent structure was one factor. Subsequently, a CFA was conducted using Sample 2 to

refine the model. The validation process demonstrated an excellent model fit, with the following indices: $\chi^2/DF = 0$, $RMSEA = 0.00$, $CFI = 1.00$, $TLI = 1.00$, $SRMR = 0.00$. Finally, the model was refined to include one latent variable represented by three items: Q36, Q45 and Q43. The specific fitting indicators of each latent variable and question can be found in Table 3.

4. Data analysis

For the entire model, there is a reasonably good model fit between five latent variables: $\chi^2/DF = 6.224$, $RMSEA = 0.060$, $CFI = 0.957$, $TLI = 0.947$, $SRMR = 0.037$. Although $\chi^2/DF = 6.224$ is greater than 3, but not much, the other model fit indices are very good, which means the model fit is still very good. For the 17-item scale after modification, the Cronbach's alpha is 0.93. The KMO is 0.950, with a significant Bartlett's test, which means that the modified scale still has good quality.

Structural equation modelling (SEM) was employed to test the proposed hypotheses implemented with path analysis in AMOS with maximum likelihood (MLM) mean adjustment. The entire model was assessed using five goodness-of-fit indices (Hair et al., 2019); (Hu & Bentler, 2021), including the chi-squared statistic ($\chi^2; p > 0.05$), the root mean square error of approximation ($RMSEA < 0.08$), the comparative fit index ($CFI > 0.95$), the Tucker-Lewis index ($TLI > 0.95$) and the standardised root mean square residual ($SRMR < 0.06$). Hair et al. (2019) argue that indicator loadings should be greater than 0.5 to be significant, while Fornell & Larcker (1981) suggest that the value of the critical ratio (CR) should be greater than 0.6 and the average variance extraction (AVE) be greater than 0.5.

The path model in SEM by AMOS and Table 4 demonstrate the direct and indirect effects of teachers' living conditions on teachers' professional identity.

5. Results

H1 hypothesised that teachers' living conditions would positively affect teachers' self-identity. Fig. 2 shows that teachers' living conditions had positive effects on their self-identity ($\beta = 0.252, p = 0.002, p < 0.05$).

H2 hypothesised that teachers' living conditions have a positive effect on teachers' working conditions. As shown in Table 4, the effects of teachers' living conditions on their working conditions showed statistical significance ($\beta = 1.155, p = ***, p < 0.05$).

H3 hypothesised that teachers' working conditions would positively affect teachers' professional identity. Fig. 2 shows that teachers' working conditions had significantly positive effects on their professional identity ($\beta = 0.728, p = **, p < 0.05$).

H4 hypothesised that teachers' professional identity would positively affect teachers' self-identity. Fig. 2 shows that teachers' professional identity had positive effects on their self-identity ($\beta = 0.471, p = ***, p < 0.05$).

H5 hypothesised that teachers' living conditions would positively affect teachers' professional development. Fig. 2

shows that teachers' living conditions had positive effects on their professional development ($\beta = 0.665, p = ***, p < 0.05$).

H6 hypothesised that teachers' professional development would positively affect teachers' self-identity. Fig. 2 shows that teachers' professional development had positive effects on their self-identity ($\beta = 0.181, p = ***, p < 0.05$).

H7 hypothesised that teachers' working conditions would positively affect teachers' professional development. Fig. 2 shows that teachers' working conditions did not have a positive effect on their professional development ($\beta = 0.176, p = 0.151, p > 0.05$).

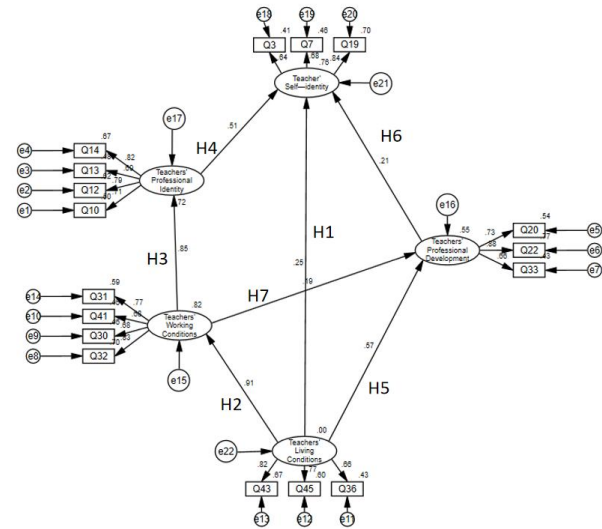


Fig. 2. Model of effects of teachers' living conditions, working conditions, professional development and professional identity on teachers' self-identity.

In Fig. 2, estimates are standardised coefficients (solid lines indicate a positive coefficient). For clarity, there is just one non-significant path ($p > 0.05$), being the effect of teachers' working conditions on their professional development.

As mentioned earlier, the results in Table 4 suggest that the indirect effects of teachers' living conditions on their self-identity were significant. However, the indirect effect of teachers' working conditions on their professional development did not reach statistical significance, indicating that teacher's working conditions would not affect their professional development but would affect their self-identity via the professional identity.

6. Discussion

According to the results, the living conditions of rural teachers can positively and directly affect their self-identity, but they can also indirectly and positively affect their self-identity through professional development. Teachers' working conditions and professional identity are the mediating variables between living conditions and self-identity and can positively affect teachers' self-identity. However, in this model, working conditions do not have a direct effect on professional development.

Firstly, consistent with previous research (Mingren & Shiquan, 2018), this research finds teachers' working conditions

Table 3. Goodness-of-fit indices of structural model.

Factor	Item	Std. factor loading	SMC	CR (>0.7)	AVE (>0.5)	Chi-squared/DF	RMSEA (<0.08)	CFI (>0.95)	TLI (>0.95)	SRMR (<0.06)	Conclusion
Teachers' professional identity	Q10	0.698	0.487	0.837	0.564	0.13	0.000	1.000	1.001	0.006	Fit
	Q12	0.799	0.638								
	Q13	0.678	0.460								
	Q14	0.819	0.671								
Teachers' professional development	Q20	0.777	0.604	0.804	0.581	0.000	0.000	1.000	1.000	0.000	Fit
	Q22	0.843	0.711								
	Q33	0.654	0.428								
Teachers' living conditions	Q43	0.750	0.563	0.799	0.572	0.000	0.000	1.000	1.000	0.000	Fit
	Q45	0.849	0.721								
	Q36	0.658	0.433								
Teachers' working conditions	Q31	0.763	0.582	0.844	0.577	0.912	0.081	0.992	0.972	0.016	Fit
	Q41	0.687	0.472								
	Q30	0.717	0.514								
Teachers' self-identity	Q32	0.861	0.741	0.77	0.53	0.000	0.000	1.000	1.000	0.000	Fit
	Q3	0.77	0.60								
	Q7	0.66	0.44								
	Q19	0.75	0.56								

and living conditions to be strongly related. The living conditions of rural teachers can affect their working conditions, indicating that their life and work overlap to some extent. The research by Su & Zou (2023) also indicates that the life and work of teachers are interrelated, and their daily lives in rural areas can affect their work. Because the rural area is considered a special community, teachers who live in rural areas are considered to be immersed in the community (MacLure, 1993).

When it comes to working conditions and professional identity, teachers' working conditions can enhance their professional identity. When their working conditions improve, teachers are able to receive more support from the school. Improved working conditions means better relationships and that teachers have access to school support and advanced equipment. This will greatly reduce the workload of rural teachers. When rural teachers have a good working environment and receive support from their school, it can enhance their professional identity. Why are working conditions a mediating variable between teachers' living conditions and professional identity? The time, including their working hours and living hours, can serve as a key to understanding. For rural teachers, life and work are overlap to some extent, which means that they have to handle work and life matters simultaneously. The development of rural areas will not only bring about better quality of life but also improve schools' hardware facilities and provide better working conditions for teachers, which can enhance their work efficiency and reduce

their psychological burden. Thus, working conditions can act as a mediating variable to enhance teachers' professional identity.

Secondly, for working conditions and professional identity, consistent with the research by Liu & Liu (2020), Lu (2016) and Monk (2007), good working conditions can enhance teachers' professional identity. Zhao's (2019a) research also shows that if rural teachers do not receive support from schools, they are overstressed in their work, accompanied by an overabundance of tasks and a reduced professional identity. Especially in primary schools, due to the lack of teacher resources, one rural teacher needs to be responsible for more than one subject and may change subjects based on the changing requirements of rural education (White, 2008). As a mediating variable, professional identity can enhance rural teachers' self-identity. When teachers are competent in their work, they will have more time to devote to their non-working life. When rural teachers can efficiently organise and deal with various aspects of their work, they will naturally feel that rural working and living is meaningful and be willing to stay in their rural area. Therefore, enhancing the professional identity of rural teachers can help enhance their self-identity. In reality, the majority of rural teachers are too overworked to balance their work and life; when the school is able to support rural teachers, it is easier for them to fulfil their tasks. Improved working conditions can make rural teachers feel that they can have time for their personal life instead of endless work.

Regarding living conditions and professional development,

Table 4. Direct effect and indirect effect of teachers' living conditions on teachers' professional identity.

Hypothesis	Standardised coefficients	Estimate	S.E.	C.R.	P	Bias-corrected percentile method		Percentile method	
						Lower Boudms(BC)	Upper Boudms(BC)	Lower Boudms(PC)	Upper Boudms(PC)
H1 Teachers' living conditions →Teachers' self-identity	0.247	0.252	0.080	3.171	0.002	0.727	0.847	0.725	0.846
H2 Teachers' living conditions →Teachers' working conditions	0.905	1.155	0.069	16.726	***	0.860	0.944	0.861	0.946
H3 Teachers' working conditions →Teachers' professional identity	0.847	0.728	0.042	17.512	***	0.702	0.825	0.801	0.887
H4 Teachers' professional identity →Teachers' Self-identity	0.506	0.471	0.062	7.545	***	0.332	0.657	0.340	0.663
H5 Teachers' living conditions →Teachers' professional development	0.565	0.665	0.164	4.063	***	0.669	0.803	0.670	0.804
H6 Teachers' professional development →Teachers' self-identity	0.209	0.181	0.048	3.770	***	0.088	0.348	0.088	0.348
H7 Teachers' working conditions →Teachers' professional development	0.191	0.176	0.123	1.435	0.151	-0.124	0.503	-0.133	0.491

Notes: Standardised coefficients. *P <0.05, **P <0.01, ***P <0.001. S.E. means standard error and C.R. means critical ratio. In addition, Bias-corrected percentile method and Percentile method are based on 95% confidence interval.

teachers' living conditions can promote their professional development. From an economic viewpoint, harsh living conditions could be a barrier to their professional development. (Ling et al., 2020). According to Maslow's hierarchy of needs, rural teachers' living is their first physiological need; after meeting this requirement they will consider their self-realisation needs for professional development (Abdulrahman & Hui, 2018). Zhao's (2019b) study shows that rural teachers are likely to experience emotional exhaustion when they cannot balance their work and life. If teachers need to spend too much time solving the problems of rural life, such as poor accommodation (Gao et al., 2017), they will not have the enough time to participate in post-service training to develop their careers. Without good living conditions, it is difficult for rural teachers to have good professional development.

The research findings confirm that teachers' professional development can enhance their self-identity (Liu et al., 2022). Teachers' professional development is different from their pre-job learning and training, in that it requires teachers to change their role and recognise their self-identity (Liu et al., 2022). Developing rural teachers means that they will have more opportunities for promotion and to participate in post-service training programmes, and promotion usually means more benefits, such as higher salaries. Teachers are more likely to stay in rural areas if they have more opportunities for promotion and post-service training than in urban areas. Career

development, which can serve as a mediator variable between living conditions and self-identity, is very interesting. In rural areas, earning respect and having more job opportunities can enhance the self-identity of rural teachers. In this study, career development can come from improving the rural environment, indicating that, instead of school, rural development can bring teachers more opportunities and resources, enabling them to enhance themselves.

For professional development and working conditions, contrary to prior findings (Barrett et al., 2015; Li et al., 2023), working conditions did not have a significantly effect on professional development in this study. Living conditions have a greater impact than working conditions on professional development as rural teachers may have to spend more time and effort on life issues. When rural teachers are able to spend less time on life issues, they have more time for their professional development. On the other hand, this result shows that the support provided by rural schools is weak: it may simply help the teachers to solve problems in their work instead of supporting their further development. It is interesting to note that living conditions have a significant impact on professional development in this model, indicating that in rural areas, the path for teachers to achieve professional development is outside the school, not within it.

The research findings confirm that improved living conditions can enhance teachers' self-identity (Ciftci & Cin, 2018;

Giddens, 2020; Liu & Liu, 2020; Mingren & Shiquan, 2018). Teachers' self-identity places more emphasis on rural belonging and community. Generally, rural teachers live in the rural area and their interactions can affect their self-identity (Ciftci & Cin, 2018; Mingren & Shiquan, 2018).

For policy makers, the primary and foremost task is to promote comprehensive rural development, exemplified by China's Rural Revitalization Policy, which aims to improve teachers' living conditions, including housing, transportation, online shopping, and more. Ultimately, such comprehensive rural development will bolster their self-identity. Secondly, policy makers can enhance the working conditions of rural schools through policies, improving both the physical infrastructure in rural schools and providing necessary support for rural teachers. In addition, policy makers should focus on their professional development, offering them more promotion opportunities through policy initiatives. These measures will collectively strengthen the self-identity of rural teachers.

For rural teachers, while it may be challenging to individually alter the living and working conditions. However, they can concentrate on their professional identity and development. By familiarizing themselves with work processes, enhancing their capabilities, and establishing positive relationships with students and parents, rural teachers can strengthen their sense of professional identity. Additionally, rural teachers need to pay attention to their career advancement, actively seeking promotion opportunities to further enhance their self-identity.

7. Conclusion

This study utilised data from the an autonomous region in China, China, to investigate rural teachers' self-identity. It examined existing research to explore the relationships between teachers' self-identity, professional identity, professional development, working conditions and living conditions. The findings suggest that living conditions positively influence teachers' self-identity, and self-identity can be positively influenced through pathways such as professional development or mediating variables like working conditions and professional identity. For rural teachers, these results hold significant implications. Firstly, enhancing the quality of life for rural teachers by improving convenience and fulfilment can directly boost their self-identity, encouraging longer-term commitment to teaching in rural areas. Secondly, the research highlights that the lives of rural teachers are interconnected with their work, indicating that enhancing working conditions and professional identity can further strengthen their self-identity. The selection of an autonomous region in China as the case study adds an international dimension to our understanding of rural teachers' self-identity, offering insights into unique cultural, social and educational contexts that contribute to the broader discourse on rural education globally.

This research has several limitations. Firstly, our reliance on online self-reported questionnaires, while common in the literature, may introduce social desirability bias, leading to potentially skewed results. Future studies could benefit from offline investigations. Secondly, the cross-sectional design of our study limits the establishment of temporal relationships be-

tween variables. Longitudinal studies would provide a clearer understanding of the developmental relationships over time.

For the generalization, this study focuses on the issue of self-identity among rural teachers, particularly in the context of China and developing countries, where rural areas are often perceived as backward and underdeveloped. This perception poses significant challenges for rural teachers in both their professional and personal lives, including poor living and working conditions, limited professional development opportunities, and low professional identity. Although the study sample was drawn from teachers in an autonomous region in China, similar issues are prevalent among teachers in other rural areas of China, as well as in rural regions of other developing countries, and even in some small towns and underdeveloped cities.

Therefore, the findings of this study have strong generalizability to such comparable contexts. However, it is also important to note that in rural areas of developed countries and large developed cities, teachers typically enjoy more favorable working and living conditions, ample professional development opportunities, and a strong sense of professional identity. This contrasts sharply with the hypotheses proposed in this study based on specific environments. Consequently, to extend the conclusions of this study to these areas, it would require more in-depth and meticulous empirical research to provide robust support.

In terms of future research directions, two key areas warrant attention. Firstly, there is a need to explore the interplay between rural teachers' personal lives and professional roles more systematically. Current research often lacks a quantitative approach, focusing more on qualitative insights. Investigating how personal lives, family dynamics, and careers intersect could provide valuable insights into the challenges faced by rural teachers. Secondly, adopting a sociological perspective alongside an educational lens can offer a more comprehensive understanding of rural education and teachers' experiences. Research should delve into how work and life are overlap for rural teachers, examining the impact on their professional identity and their self-identity. Given the high ethical standards and societal expectations placed on rural teachers in China, understanding their work-life boundaries and potential support systems for non-teaching tasks are crucial for enhancing their wellbeing and job satisfaction.

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Conflict of interest

The authors declare that they have no conflict of interest.

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