Data Investigation and Analysis Based on Grounded Theory

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Abstract. The task of building rural teachers team is an important part of the rural revitalization strategy and the key to developing local education. Based on grounded theory approach, theoretical sampling was applied in semi-structured interviews of teachers in 12 counties (cities, districts) of minority region in southwest Guangxi. In this study, through the survey data analysis and coding, through open coding, axial coding and selective coding on the interview data, we found some problems in the minority region of southwest Guangxi such as shortage of teachers, structural imbalance, poor teaching quality, unsuitable training mode. To tackle these problems, we propose some solutions to the development of excellent teachers team and the directional and localized training that highlights national advantages in order to provide a good reference for the development of the rural teaching body in China’s minority regions.

Keywords: Data coding ; Grounded theory ; Minority region in southwest Guangxi; Rural teachers.

1. Introduction
The world today is undergoing major development, changes and adjustments. In essence, the competition of comprehensive national strength is one of scientific and technological innovation and progress. At the core is the competition of talents, whose cultivation depends on education. We clearly see that unbalanced and uncoordinated education development is still a problem in China, which is manifested through the disparity between urban and rural education, shortage and improper distribution of high quality education resources, unbalanced development of urban and rural education, weak implementation of compulsory education in the countryside, and slow progress in poverty-stricken and minority regions. The minority region in southwest Guangxi is home to the Zhuang, Yi, Yao, Miao, Dong, Hui and other ethnic minorities. It is a special area including old revolutionary base area, ethnic minority area, border area, mountainous area, poverty-stricken area and reservoir immigration area. Due to the special natural and humanistic environment in southwest Guangxi, the overall development of rural teachers team in this region faces challenges, and the vocational attraction of rural teachers needs to be improved urgently.

2. Research Design
Research strategy depends on the purpose and problem of the research (Chen Xiangming, 2006). This study focused on investigating the current development situation of rural teachers team in minority region in southwest Guangxi and its problem analysis. This is a practical study for which qualitative research method is suitable due to insufficient existing research and lack of references for problem analysis regarding this issue. In addition, it is necessary to process, summarize and analyze primary data in depth when discussing feasibility factors. Therefore, grounded theory approach is chosen herein for induction of phenomena.
2.1. Research Method and Process
Grounded theory approach is to summarize phenomena and aims to help researchers further develop theory on the basis of original data. Its core is to gradually develop concepts, secondary and core categories, and the level of abstraction of their mutual relationships via induction, comparison, and analysis with scientific logic, and eventually form a new theoretical system (Glaser and Strauss, 1967). It specifically includes three coding methods: open coding, axial coding and selective coding (Glaser, Strauss, 1967).

2.2. Research Objects
On the premise of satisfying theoretical sampling, 155 teachers from 12 counties (cities and districts) in southwest Guangxi were selected for interviews. Specific interview information is shown in Table 1.

Table 1. Summary of interviewees’ information.

| Positions                                      | Number | Time | Times | Notes   |
|------------------------------------------------|--------|------|-------|---------|
| Directors/deputy directors of county-level education bureaus | 9      | 30min| 2     |         |
| Heads of county-level sections of personnel/basic education | 23     | 30min| 2     |         |
| County-level junior high school principals     | 22     | 30min| 2     |         |
| County-level senior high school principals     | 11     | 30min| 2     |         |
| County-level elementary school principals      | 29     | 30min| 2     |         |
| County-level elementary school teachers         | 28     | 30min| 2     |         |
| County-level junior high school teachers        | 19     | 30min| 2     |         |
| County-level senior high school teachers        | 14     | 30min| 2     |         |

3. Data Coding
The process of data analysis is also the process of data coding, and the grounded theory mainly goes through the three-level coding process successively, which includes open coding, axial coding and selective coding.

3.1. Open Coding
In the process of open coding, special attention should be paid to the original words of the subjects, and an important principle should be followed at this stage: believe everything and believe nothing (Strauss, 1967). In this process, researchers always keep an open mind and encode data according to the state presented by the subjects themselves. As shown in Table 2.

Table 2. Part of examples of original conceptual data coding.

Sample of Representative Original Conceptual Data

- A1-6, A3-1 Aging of rural teachers who are 48 years old on average; faultage of talents and reserve talents are scarce; elder teachers are unwilling to leave villages and young teachers unwilling to come in.
- A2-10, A4-4 Mismatch between teachers and their professions, i.e. Chinese language teachers teach PE or Art, Mathematics teachers teach Music or Art, and graduates of Information Engineering teach English.
- A1-13, A2-9 At special posts in villages and towns, normal students are not willing to stay at the teaching position; they see it as a springboard instead; the management ability of head teacher.
- A2-11, A3-6 High quality teachers who are professional in their fields, love teaching and have strong abilities.
- A1-3, A4-16 There is a cultural atmosphere, but more intellectuals and a more civilized social environment are needed.

Data source: Sorted by author based on original data

3.2. Axial Coding
Axial coding refers to exploring the relationships between the main category and its secondary categories in the original data and creating various connections between the concept categories. In the process of primary coding of the original data, 215 initial concepts are obtained after preliminary
conceptualization, and 22 categories are obtained after generalizing the initial concepts. Specific examples are as follows:

Table 3. Part of samples of the initial concept coding.

| Concept Category          | Sample of Representative Original Concept Data                                                                 |
|---------------------------|---------------------------------------------------------------------------------------------------------------|
| Subject structure         | A1-1, A2-1 For primary schools, there is still an urgent need for majors such as English, music, art, etc.    |
| Teaching quality          | A4-3, A2-6 Low teaching quality and weak teaching foundations of rural teachers                               |
| Teachers structure        | A3-3, A2-2 Mostly female, few male, and aged above 45 on average                                              |
| Aging                     | A1-6, A3-1 Aging of rural teachers who are 48 years old on average; talents and reserve talents are scarce    |
| Professional counterpart  | A2-10, A4-4 Subjects not in line with teachers’ majors, such as Chinese language teachers teach PE and art   |
| Large mobility            | A1-13, A2-9 Teachers are not willing to teach in villages and see their jobs as a springboard, leading to instability |
| Good Quality Teachers     | A2-11, A3-6 Love teaching, professional with strong abilities                                               |
| Teacher Shortage          | A2-3, A3-10 Lack of high quality teachers and specialized teaching teams                                       |

3.3. Selective Coding

Selective coding refers to selecting core category concepts among the discovered and created categories, taking the core category as "storyline" to create the relationship between the core category and other categories. In this paper, five core categories are summarized based on the comparison and analysis of categories, as shown in Table 4.

Table 4. Samples of category axial coding.

| Main Category                        | Secondary Category                        | Correspondence between categories                                                                 |
|--------------------------------------|-------------------------------------------|---------------------------------------------------------------------------------------------------|
| Scarce teacher resources             | Insufficient reserve of teachers          | The shortage of teacher resources is mainly reflected in the difficulties in introducing new teachers and finding channels to do so, poor teaching quality, lack of art teachers and teachers for minor subjects. Irrational discipline structure is the direct cause of the gap in teacher’ expertise. Leftover problems are the main reason for temporary shortage of teacher resources. The shortage of teachers’ reserve and training channels are the main reason for the shortage of teacher resources. |
| Imbalance in teaching staff          | Aging of teachers                         | Aging of teachers affects the structural allocation of teachers; gender imbalance affects the structure of teachers; teacher mobility will change the structural situation of teachers; professional mismatch leads to the unreasonable professional structure of teachers, among which, technical secondary school teachers and substitute teachers are common, and insufficient number of high-level professional teachers leads to the structural imbalance of teachers. |
|                                      | Gender imbalance                          | Teachers’ knowledge, teaching methods and professional knowledge are outdated, and together with insufficient teaching skills, the teaching quality is poor. |
|                                      | Mobility                                 | In terms of current training mode for teachers, there aren’t sufficient directional training, localized training and professional training. |
|                                      | Professional mismatch                     |                                                                                                    |
|                                      | Under-educated                           |                                                                                                    |
|                                      | Low professional title                   |                                                                                                    |
| Poor teaching quality                | Obsolescence of teachers’ knowledge       |                                                                                                    |
|                                      | Underdeveloped teaching methods           |                                                                                                    |
|                                      | Lack of professional knowledge           |                                                                                                    |
|                                      | Insufficient teaching skills             |                                                                                                    |
| Unsuitable training mode             | Deficiency in directional training        |                                                                                                    |
|                                      | Insufficient professional training       |                                                                                                    |
| Lack of emotion toward rural education| Great mobility of teachers               | Most of the young rural teachers only stay for contracts. They are unwilling to stay in the countryside which gives them a great mobility. This is due to their low recognition of the position of rural teachers. |
4. Research Results

4.1 Scarce Teacher Resources

Rural teacher resources in southwest Guangxi minority regions show a specific phenomenon of "real shortage", which means that the total number of teachers seems to be sufficient, but actually high-quality professional teachers are lacking. Due to the general impression of minority regions in southwest Guangxi being remote and backward, majority of college students are not willing to engage in the rural teaching professions, and most teachers refuse to work in the countryside. Moreover, a large number of outstanding rural teachers, especially the newly introduced special teachers, are transferred, objectively leading to the shortage of reserve of rural primary school teachers in southwest Guangxi.

In addition, according to the survey research on rural teachers of 12 counties (cities, districts) in minority regions of southwest Guangxi, due to historical reasons such as fulfillment of teachers’ quota, no new teachers had been recruited for nearly 10 years between 2003 and 2012. This causes a faultage in teacher staffing, which is shown in lack of young teachers, retirement of old teachers and insufficient backbone force, thus making the gap of rural teacher resources in minority regions of southwest Guangxi grow bigger.

4.2. Imbalance in Teaching Staff

The aging problem of rural teachers in southwest Guangxi is serious, and there are relatively few young teachers. In terms of gender, female teachers are majority, while male teachers are scarce. Among surveyed rural teachers in the 12 counties (cities and districts), 1,618 teachers were under 30 years old, accounting for only 13.07% of the total rural teachers, 2,930 teachers aged 31-39, accounting for 23.66%, and the other teachers all over 40 years old. A principal of a rural central school said, "Young teachers are hard to find in a rural primary school, what’s left are all over 50 years old". The head of personnel section of the Education Bureau said, "There are very few young teachers in rural primary schools, male teachers are even rarer."

In addition, the professional structure of rural teachers in southwest Guangxi is also unbalanced. Since the implementation of nine-year compulsory education, rural primary schools in all counties have set up new subjects one after another, but such teaching activities are nothing but a racket. Primary school subjects mainly include Chinese, Mathematics, English, Science (comprehensive), Physical Education, Music and Art; however, the number of teachers teaching Science, Physical Education, Music and Art is seriously low, and teachers' own majors are not in line with the subjects they teach.

4.3. Poor Teaching Quality

Rural teachers in southwest Guangxi are mainly graduates of junior colleges and technical secondary schools. Teachers at special posts with bachelor’s degree are not many, and they did not go through teachers’ training programs at schools. On the one hand, their knowledge of the subject is not solid, and they have not received systematic training of teaching skills. "Some teachers at special posts are no match for graduates of technical secondary schools in terms of teaching ability." On the other hand, most of the teachers at special posts just want to use their title as a springboard. They already start looking for opportunities to leave during the service. Some of them are not settled for teaching and have no self-requirement, and their overall quality is low.

In terms of professional levels, intermediate teachers are majority and senior teachers are few. The proportion of associate senior teachers to rural teachers is low; even intermediate teachers are not many; most of them are junior teachers and below, and there is a shortage of quality teachers. In terms of teacher's tile structure, senior teachers are mainly in primary schools in counties and towns, while primary teachers are mainly in rural areas, who have insufficient ability of teaching, research, learning, and innovation. In addition, some rural teachers still hold the notion of "how to teach in the past, how to teach now." They are not innovative enough in their teaching methods, and some teachers have even never bought reference books for teaching. In general, the teaching quality is poor and the quality teacher resources are insufficient in rural primary schools.
4.4. Unsuitable Training Mode
At present, normal universities that undertake the training task of compulsory education teachers in Guangxi are Guangxi Normal University, Nanning Normal University, Yulin Normal University, Guangxi Normal University for Nationalities, Guangxi Science and Technology Normal University, Guilin Normal College, Guangxi College of Education, etc. Comprehensive universities that undertake this task are Beibu Gulf University, Baise University, Hechi University, Wuzhou University, Hezhou University, etc. Rural teachers in southwest Guangxi mainly come from Baise University, Nanning Normal University, Guilin Normal College and Yulin Normal University. However, directional trainees in the existing training units are insufficient, and the localized training are not effective. One interviewee said, "Most teachers of the county are recruited from other provinces and counties and there are a few local teachers, so the staffing is not stable. We suggest greater efforts in training of general teachers. Directional training of local teachers can help us better retain the teachers in our county. At the same time, training of highly educated teachers of general subjects should be taken into consideration. Currently, most general education programs can lead to junior college degrees. Undergraduate education was started in 2018, but the number of places allocated at the district level is too few. Only 10 of them have been given to us."

4.5. Lack of Emotion toward Rural Education
Due to a lack of emotion toward rural education, normal school graduates are unwilling to go to or stay in rural areas. They do not have passion for rural education career, nor wish to become teachers and settle in the countryside. They see the job of being rural teachers more as a springboard and a transition to the next career. The main reason is that normal programs are not designed for training rural teachers. According to the analysis on employment data of graduates majoring in elementary school and preschool education in the recent three years provided by Baise University, Hechi University, Guangxi Science and Technology Normal University, Guangxi Normal University for Nationalities, Guilin Normal College and Guangxi College for Preschool Education, we found that because normal programs are not designed for training rural teachers, graduate employment is diversified. College students do not identify with rural teachers, and some of them choose rural schools solely due to being bounded by contract.

5. Suggestions and Strategies for the Development of Rural Teachers Team in Minority Region of Southwest Guangxi

5.1. Strengthen the Development of High-quality Teacher Teams
In the process of original data coding, strengthening inclination for quality education can be summarized as the demand for quality teachers, quality management, quality teaching, and sound environment, as well as the management that can cultivate more excellent students for further education. In the interview, a principal said that "teachers in rural schools are the soul of the whole village, as students see the world through teachers". Teachers play an important role in rural development and revitalization, and only high-quality teachers can take on this important task. One of the most mentioned quality about teachers is being specialized while versatile.

**Table 5. Coding samples of quality education inclination.**

| Main Category          | Secondary Category | Original Concept Samples                                                                 |
|-----------------------|--------------------|-----------------------------------------------------------------------------------------|
| Quality education     | Quality teachers   | Being specialized while versatile, high quality, solid foundation, good morality          |
|                       | Quality management | Systematic management platform, resource sharing, communication platform, interactive cooperation, complementary advantages |
|                       | Quality teaching   | Good classroom performance, students learn effectively                                   |
|                       | Sound environment  | Wish for a basketball court, toilet repaired, more street lights, a good library, computers, multimedia facilities |

Strengthening quality management is mainly reflected in the management of students. Teachers can educate, manage and guide students by applying psychological and teaching concepts. Management of students in the new era relies not on the ferule but on knowledge and art. Strengthening quality teaching is mainly reflected in that teachers can teach well and students can learn knowledge.
Strengthening the development of sound environment should be reflected in the school's infrastructure, information equipment and other hardware. For example, the teachers in the interview hoped that the school has a better library and more multimedia facilities.

5.2. Directional and Localized Training of Teachers that Highlights National Advantages

Combined with local characteristics, local advantages are brought into play to highlight national advantages. The results of this study show that the professional training of teachers mainly includes special training, specialized training and sustainable development training.

**Table 6.** Coding samples of professional training of teachers.

| Main Category                                                                 | Secondary Category                          | Original Concept Samples                                                                 |
|-------------------------------------------------------------------------------|---------------------------------------------|-----------------------------------------------------------------------------------------|
| Directional and localized training of teachers that highlights national advantages | Special training of teachers                | Specially set up independent normal programs, independent management, independent enrollment |
|                                                                                | Specialized training of teachers            | Scientific, theoretical and systematic training                                          |
|                                                                                | Sustainable development training of teachers | Continuous education, on-the-job training, connecting pre-and post-job training           |
|                                                                                | Directional and localized training          | Oriented toward villages, select students of minorities, priorities given to local students |

Data source: Sorted by author based on original materials

In terms of directional and localized training that highlights national advantages, students recruitment shall combine with the local ethnic conditions and direct toward local places, towns and even villages. Related research also suggests that minorities are more likely to accumulate and stay in their native places, and minority college students are more willing to return to and develop their hometowns (Qianping Du, 2017). Minority regions cultivate unique national psychology, and ethnic identity determines the behaviors of people in minority areas. These are the conditions for the potential of their development upon return. The southwest of Guangxi is mainly inhabited by Zhuang, Yao, Hui and Yi minorities, where different ethnic cultures intersect yet remain independent. Ethnic minorities are generally characterized by high anxiety & tension and low intelligence & stability, etc., and have a high sense of ethnic identity. Therefore, localized training combined with local ethnic characteristics is a feasible way to solve the problem of rural teachers.

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