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Teacher Training Needs and their Influencing Factors: A Case Study of 13 Chinese Border School Teachers

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Abstract. Teacher training is not only the way to improve the quality of teachers in China's border areas, but also one of the collaborative paths to promote the high-quality development of regional education. Teacher training needs to provide a practical reference for specific service teacher training. Through conducting semi-structured, in-depth interviews, and using the grounded-theory three-level coding method for discourse analysis, this study explores teacher training needs and their influencing factors and how such factors influenced teacher learning and the development of teaching communities in border areas, in China. In the coding process, the researchers used MAXQDA (20.4.0) for auxiliary analysis. This work has constructed a model of teacher training needs and its influencing factors. Teacher training needs in border areas include training format, training content, training intensity, training opportunities, and training practicality. The factors include subjective factors, organizational development, institutional environmental factors, and field culture factors. According to the results of the model analysis, we put forward these optimization strategies: provide special mental health courses and counseling services for border teachers; carry out school-based training to form teachers' learning community; plan special training and create an international influence of border education, which would enhance teachers' sense of professional honor and improve the perception threshold of achievement.

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1. Introduction and Literature Review

The key to revitalizing education in border areas, in China, lies in teachers who take on the responsibility of improving the quality and creating a good image of national education. Teacher training is an effective way to promote the professional development of teachers and enhance teachers' professional qualities. The "14th Five-Year Plan" formulated by the Chinese government (2020) puts the construction of the teaching team as a link to a high-quality education system. It proposes to "build a high-quality professional teaching team" (National Development and Reform Commission, 2020). The "Teacher Education Action Plan (2018-2022)" proposed that all localities should earnestly strengthen the task of teacher training in remote and poverty-stricken areas (Ministry of Education, National Development and Reform Commission, et al., 2018). The United Nations' Sustainable Development Goals 2030 advocate "taking into account the needs of poor and marginalized groups" (United Nations, 2020). However, there is still significant gaps in funding, training teachers, and training quality in border and non-border areas (Zhong & Jiang, 2017). The professionalism of teachers in remote areas is out of line with the national average (Li, 2020). In this practical problem and policy orientation, it is necessary to investigate and analyze the demand for teacher training and its influencing factors in border areas.

Teacher training needs analysis is an activity to determine whether training is needed and what training is needed before planning and designing it (Zhao et al., 2010). At present, the research on teacher training needs analysis shows three trends: one is the top-down model construction of teacher needs analysis. Shen et al. (2016) constructed a "behavior-oriented teacher training demand analysis advanced model" based on the OTP model (Organization-Task-Person)* and performance analysis model. The OTP model and the performance analysis model were initially applied in industrial and commercial training, and so that the adaptability of teacher training would be further strengthened and improved. For example, the performance analysis model presupposes a priori that the cause of the performance gap is either a lack of personal knowledge and skills, or the work environment within the organization. This dichotomous factor is a fixed point of view, and the teacher is a human being. The initiative and unfinished nature of development violates harmony (Wang & Guo, 2016).

The second trend is the analysis and research based on teachers' professional standards. Researchers have conducted an analysis of teacher training needs based on the "Professional Standards for Teachers" issued by the Ministry of Education of China (Feng, 2015; Zhang, 2017), and formulated the dimensions of teacher training needs. The analysis of teacher training needs, based on

* The OTP (Organization-Task-Person) model is proposed by McGehee and Thayer in "Training in Business and Industry" in 1961, and is constructed by a three-part system of organization analysis, task analysis and personnel analysis. This model is widely used in the field of teacher training in China. For further reading see McGehee, W. & Thayer, P.W. (1961). *Training in Business and Industry*. Wiley.

professional standards, has authority and promotion value. Still, the homogeneity is serious, and it is challenging to take care of the different needs created by the various working environments of teachers. The research subjects were mainly teachers in non-border areas, of which there is a lack of inquiry into the training needs of teachers in border areas.

The third trend is that the research paradigm is mostly quantitative research, which lacks qualitative research. The starting point and goal of teacher training is to meet the characteristics of adult learning and the needs of teacher professional development (Zhao& Liang, 2010). Therefore, most research focuses on empirical quantitative research: the quantitative statistical analysis method of empirical investigation to focus on the quantitative characteristics, relationships, and changes of factors affecting teacher training needs (Xiao, 2020; Song, 2020; Wang & Hu, 2021). However, the limitation of quantitative research is that it pays too much attention to the information conveyed by "digital data", and it is challenging to micro-interpret the essence of teachers as "people." Taking the viewpoints of this research as an example, in a specific field, a teacher's "professional life quality" is related to the happiness of teachers' lives and the realization of personal values. Therefore, the starting point of teacher training is not only to focus on teachers' professional development, professional quality, and other elements, but also to give more humanistic care to teachers' "professional life quality" and teachers' mental health.

In summary, the current research results on the analysis of teacher training needs are relatively abundant, and the research methods, research objects, and research perspectives provide a lot of material and insight to this article. However, there are still some deficiencies: (1) a lack of research on the analysis of teacher training needs in border areas; (2) a lack of qualitative research paradigms, resulting in insufficient grasp of the richness and initiative of teachers' human development; and (3) the lack of experience in bottom-up research on theoretical construction of data leads to poor applicability of the research results and limited guidance for training planning and training evaluation.

This research utilizes front-line teachers and administrators in the border areas of Guangxi as the research informants, collects empirical data through in-depth interviews, and is guided by grounded theoretical methods. The researchers suspended theory in the process of analyzing data. Through the bottom-up approach, the demand for teacher training in border areas and its influencing factors are analyzed.

Specifically, this research focuses on the following issues: (1) What are the actual training needs of teachers in border areas? (2) What are the factors that affect the demand for teacher training? (3) How do these factors affect the demand for teacher training? Finally, (4) what is the link between these factors?

2. Methodology and Research Procedure

2.1. Grounded Theory Study

This study has used the "grounded theory" proposed by Glaser and Strauss (1967), which is one of the essential research paths in the qualitative paradigm. Its focus is not to test hypotheses, but to discover, explore, and construct ideas by analyzing data. Its research purpose is to generate views based on empirical data in the research process, to collect systematically and analyze data for phenomena, and to discover, develop and test hypotheses from the data. The research results are the theorized presentation of reality.

Using grounded theory methods allows an investigation into the need for teacher training in border areas and its influencing factors can acknowledge the main demands and practical needs of teachers and avoid the shackles of theory-oriented research.

Coding analysis is the most critical part of research using grounded theory. By encoding the data, researchers can interpret the information level by level, conceptualize the original data, and then classify the concept group according to the attributes, in order to construct the theory level by level. The coding process is divided into three steps, namely open coding, axial coding, and selective coding (Kuckartz, 2014).

According to the general procedure of the grounded theory (Figure 1), the thesis needs to be tested for saturation after the coding is completed. Through repeated comparisons of coding results and circular theoretical saturation tests, a model of teacher training needs and their influencing factors is finally constructed.

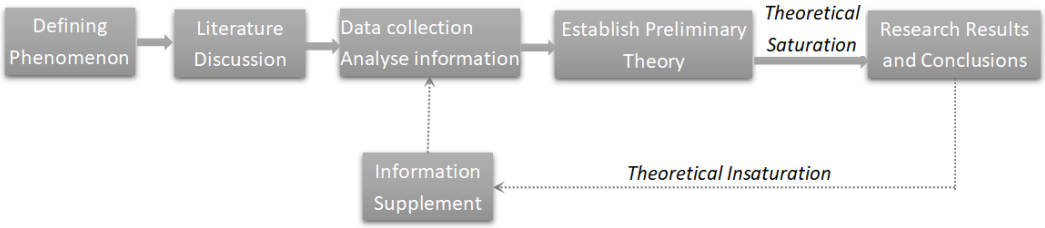

Figure 1: Grounded theory research process (Morrison, 1998)

2.2. Participants and Data Collection Tools

This study selected X County of Guangxi Zhuang Autonomous Region as the field point, and semi-structured interviews were used during the fieldwork. The interviewees were 13 frontline teachers from four different types of schools in X County (X County Senior High School; X County Minority Middle School; X County S Township Central Primary School; X County Minority Middle School), consisting of six males and seven females. After obtaining their consent, each interview was recorded, and detailed interview notes were made.

The researchers conducted interviews according to the following interview outline:

Table 1. Interview outline

Question category	Purpose	Examples
Relevant questions (General issues related to personal professional development)	➢ Enter the interview scene. ➢ Teachers talk about personal professional experience.	Have you been working in the border area?
Core questions (6~12 questions directly related to teacher training)	➢ The teacher answers the core questions. ➢ Teachers talk about the topic and express their opinions. ➢ Ask all the interviewed teachers' core questions.	What type of training have you attended? What impact will these trainings have on your teaching and professional development?
Extended questions within the interview outline (Specific questions based on certain information of the core question)	➢ Answer certain aspects of the core question. ➢ Get more details about the problem. ➢ Ask questions according to the teacher's answers.	It sounds like you are very familiar with the local teacher training. Can you tell us in detail about the training specifically for the mental health of border teachers?
Extended questions outside the interview outlines (New questions based on the content of the teacher's answers)	➢ Respond to some aspects of the teacher's answer. ➢ Get more details about the answer. ➢ Ask questions based on the teacher's answers.	You mentioned that teachers in border areas have not received the spiritual support. Can you talk about it in detail?

To test the theoretical saturation of the category and achieve the need for accurate model construction, the researchers randomly selected three teachers and two administrators at the field site; after the initial interview, a second semi-structured interview via telephone was conducted. After that, two teacher interview records and one administrator interview record were randomly selected for coding analysis. The other two interview records are retained as final theoretical saturation test materials. In the process of qualitative analysis of the three interview records, it was compared, refined, and revised with the coding genera group until no new concepts entered the genera group, and to reach theoretical saturation.

2.3. Three-Level Coding Process

The researchers manually translated the recordings into Microsoft Word files within 48 hours after obtaining the materials. They checked them more than three times in combination with the text materials recorded during the interview. Before coding, the researchers listened to the recording three times and reviewed the transferred text repeatedly to ensure the accuracy and authenticity of the original data. The coding process was analyzed with the help of MAXQDA (20.4.0) qualitative analysis software.

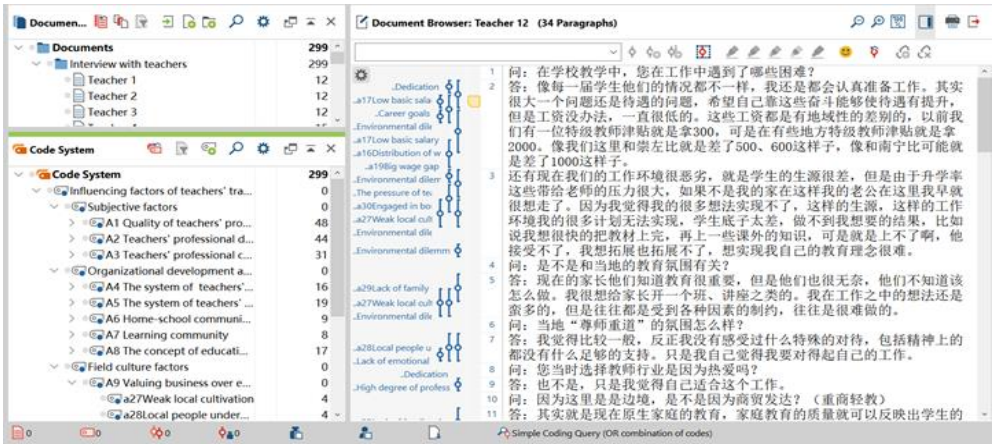

Figure 2: MAXQDA (20.4.0) Qualitative analysis software operation page

2.3.1. Open Coding

Open coding is the initial stage of processing raw data. Researchers carefully read the primary data line by line; use keywords, phrases, or short sentences to conceptualize the original sentences (Table 1), and then classify those concepts from a generic category. In the open coding stage, a description of a phenomenon, the original vocabulary, and phrases can be directly transferred from the data for conceptual illustration. For example, when analyzing the sentence "Anyway, our work must be done as much as possible, relying on our sense of responsibility", the initial concept is defined as "responsibility". Concepts with similar attributes to "responsibility" (such as "love" and "dedication") is uniformly coded as "professional ethics". To classify those points more objectively, the two researchers who participated in the previous interviews independently carried out initial conceptualization, denoted by “a”. After the two researchers repeatedly checked and modified the initial concept to reach an agreement, the attributes and dimensions of the concept were further determined. The concepts belonging to similar phenomena were combined into the abstract category to which they belonged. In the open coding stage, 65 initial concepts (after deleted the same concepts), forming 23 types (Table 2), denoted by “a”, were extracted.

Table 2. Examples of initial concept extraction

Original Sentence	Initial Concept
T12 (L19): But now I have not attended the top class for six years, but I have also made great achievements in these six years. When my students came in, the average score was very low, but through the past few years, they are making progress.	a3: Realization of personal value
T10 (L22): Expert guidance. I think expert guidance is more effective, and it is best to have an expert over to guide us on the actual situation.	a40: On-site guidance by experts
T1 (L12): We have participated in various studies in the county, and all of them.	a50: A wide variety
T11 (L16): Yes, it seems to be once last year.	a53: 1-2 times a year

Table 3. The generalization of open coding

Initial Concept	Genericization	Points
a1 Loss of the spiritual world; a2 Fragmented teaching life; a3 Realization of personal values; a4 Contradiction between ideals and reality.	A1: Quality of teachers' professional life	48
a5 Professional ability; a6 Professional knowledge; a7 Self-improvement behaviour; a8 Professional development attitude;	A2: Teachers' professional development	44
a9 Professional ethics; a10 Professional vitality; a11 Professional ideals and beliefs; a12 Professional emotions.	A3: Teachers' professional cognition	31
a13 Teacher composition; a14 Title management; a15 Performance evaluation.	A4: The system of teachers' management	16
a16 Allocation of allowances and benefits; a17 Low basic salary; a18 Imbalance of returns; a19 Large wage gap.	A5: The system of teachers' material guarantee	19
.....	.....	
a61 Impractical; a62 Out of practice; a63 Weak operability.	A22: Practical results	7
a64 Subjective feeling; a65 Method reference.	A23: Teacher experience	10

Genera generally have sub-categories and dimensions. Not all categories have the same weight. Therefore, the researchers needed to analyze the 23 types in the open coding stage (Table 3) to determine the dimensions of their categories so that they could focus on subsequent analysis.

Table 4. An Example of the analysis of the generic dimension of the open coding stage

Genus	Sub-genre	Dimension
A1 Professional quality of life	Spiritual world Teaching life Personal value Ideal and Reality	Support-Ignore Rich-monotonous Realization-missing Consensus-contradiction
A2 Teachers' Professional Growth	Professional Ability Professional knowledge Self-improvement behavior Professional development attitude	Strong-weak Solid-weak Active-passive Positive-negative
A3 Teachers' professional	Cognition, professional ethics Professional vitality Professional ideals and beliefs Professional mood interlaced	High-low Strong-weak High ambitions-doing nothing Positive-negative

The subcategory is related to the concept of the category, which makes the category clearer and more definite. The dimension is the extent of the change in the overall attributes of the category, which clearly explains the category and makes the theory changeable. Identifying and defining the dimensions and sub-categories of the category is an essential analysis process in the open coding stage and determines the rationality and regularity of the formed category (Strauss & Corbin, 1998).

2.3.2. Axial Coding

Axial coding is the further abstract of the classification of the category. Specifically, it combines the connections established between open coding categories in a new way, generally based on coding paradigms such as conditions, contexts, strategies, and results (Strauss & Corbin, 1998). In the axial coding stage, eight main categories were finally obtained (Table 4).

Table 5. Axial coding

Open Coding (generic)	Main Category
A1 Quality of professional life; A2 Teacher professional growth; A3 Teacher professional cognition.	Main factor
A4 Teacher management system; A5 Material guarantee system; A6 Home-school communication; A7 Learning community; A8 Education and management concepts.	Organizational development and institutional environmental factors
A9 Emphasizes business and despise education; A10 Home country sentiments.	Field cultural factors
A11 School-based training; A12 Project training; A13 Expert guidance.	Training form
A14 Subject teaching knowledge; A15 Education concept.	Training content
A16 Training funding input; A17 Training coverage; A18 Organization training frequency; A19 Auxiliary resource allocation.	Training intensity
A20 Rural small-scale schools are in short supply of training opportunities; A21 Disciplinary training places are limited.	Training opportunities
A22 Practical effectiveness; A23 Teacher experience.	Training practicality

2.3.3. Selective Coding

Selective coding is a process of identifying the core genus, systematically linking all other categories with the core category, verifying these connections, and supplementing those that need further development and revision. The researchers recombined the eight main categories. Finally, the training form, training content, training intensity, training opportunities, and training practicality were classified as the core category of "teacher training needs". The subjective factors, organizational development, and institutional environment factors, and field

cultural factors were identified as the core category of "factors affecting teacher training needs".

2.4. Accuracy and Preciseness of the Study

The criteria for evaluating qualitative research include research credibility, dependability, conformability, and transferability (Creswell & Guetterman, 2019). During the research process, the researchers participated in the field survey and data analysis process. The interview content of some early participants was used to check the theoretical saturation of the initial code to improve the credibility of the data. The reliability of the data has been ensured through in-depth and long-term discussions and discussions among the researchers through peer evaluation.

To improve data consistency, the selection of research objects maximized the difference as much as possible. Two experts in the field of teacher education research repeatedly evaluated the analysis results to confirm the consistency of the data analysis. In addition, to improve the generalizability of the data, the researchers provided sufficient data descriptions in the text so that other researchers could critically review the research result.

3. Results and Discussion

Through the three-level coding process and theoretical saturation test, this research finally constructed a "teacher training demand and its influencing factors model" (Figure 3).

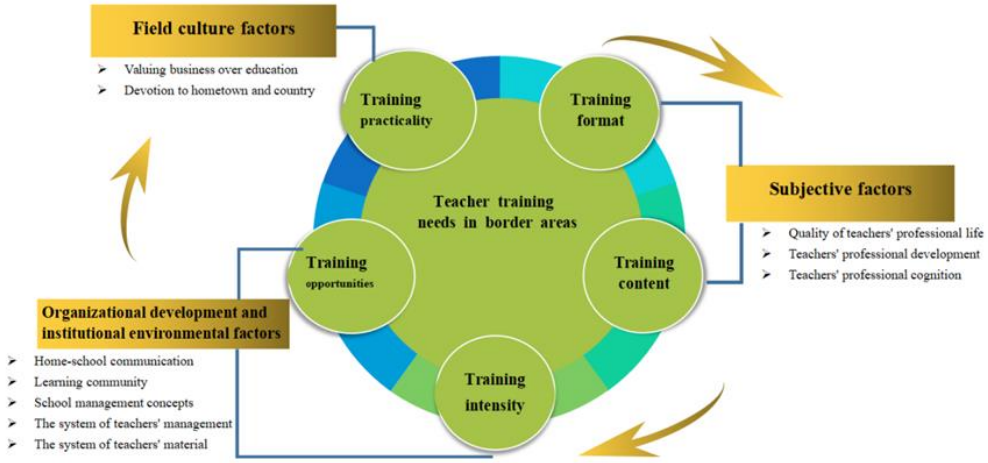

Figure 3: The model of teacher training needs and its influencing factors

Using the three-level coding method of grounded theory, the needs of teacher training in border areas have been summarized into five aspects: training form demand, training content demand, training intensity demand, training opportunity demand, and training practical request.

3.1. Teacher Training Needs in Border Areas

3.1.1. Training Format

The needs for the form of training include the demands for expert guidance, school training, and project training. Among them, teachers generally have the

most vital market for expert training. Expert guidance is divided into two ways: firstly, inviting experts to guide teachers and secondly, organizing teachers to participate in the "case-style" lectures presented by front-line education experts. The purpose of "inviting experts" in one-to-one guidance is to solve the complicated problems that arise in the process of teachers' daily teaching and student management, in real-time, in a targeted manner. Teachers listen to "case type" lectures is to get inspiration from vivid and typical cases.

Corresponding to these two methods is the "dominant" addresses. A study shows that 86% of teachers are opposed to "dominant" lectures. This type of training in large-class "dominant lectures" tends to place too much emphasis on the overall unified education, ignoring individual education, practical needs, and psychological tolerance (Zhou, 2011).

The most crucial difference between "inviting experts" one-on-one guidance and "case-style" lectures and "teaching-style" lectures is the difference in the order of training subjects. The former is based on teachers as the mainstay and experts as the guidance. The latter is based on the "classroom deduction" with experts as the main body, constructing an ideal educational environment with a "utopian" language. However, it is still questionable what the real needs of teachers may be. It is to solve the most basic and practical problems in work.

One-on-one guidance by "inviting experts" is more suitable training for teachers in border areas. It not only solves the problem of teaching practice in a targeted manner but also instantly solves the predicament that most teachers cannot go for training due to heavy teaching loads.

"Case-based" training is heuristic training. Experts vividly tell typical cases, arouse the resonance of participating teachers, and generate reflections based on their actual experiences.

3.1.2. Training Contents

The training content requirements include the need for subject teaching knowledge and education concept knowledge. Teachers of different ages, educational backgrounds, and various teaching situations have different needs for training content. Compared with non-border areas, the unilateral mobility of teachers in border areas is greater (Ning & Shi, 2017), and the faculty of teachers are facing an aging structure (Zhong, 2017).

The survey also found that the age distribution of teachers in border areas showed a trend of polarization, and the design of education background was solidified. Even if teachers have scientific-educational teaching knowledge, they still have the general problem of “unable to teach” and “can’t teach well”. The fundamental reason is that the border teachers’ local empirical knowledge and scientific teaching knowledge are not well connected. On the one hand, it is reflected in the conflict between the prescriptive pieces of the method and the teachers own local culture-cognitive elements in the process of practice, leading to the phenomenon of “can’t teach well”; on the other hand, it is reflected in the conflict between the universality of methods and the particularity of border students in their learning

process (for example, early participation in family border trade activities leads to the alienation of ideas, "study is useless", "business is more important than teaching" and "cross-border ethnic identity" problems emerge), which leads to the phenomenon of "poor teaching".

The border cultural characteristics and experience of border teachers have become the support of "local capital" to launching teaching. Hence, the presence of teachers' local empirical knowledge in the school field is essentially an integration of the two cultural spaces. Therefore, the formulation of training content should not be "totally copied" but should promote the deep connection between teachers' local empirical knowledge and scientific, educational teaching knowledge to solve the dilemma of "unable to teach" and "can't teach well" of border teachers. Among them, scientific-academic knowledge provides theoretical guidance for teachers' local practical knowledge, and teachers' local empirical knowledge enriches the exploration space of scientific-academic teaching knowledge (Wang, 2019).

3.1.3. Training Intensity

Training needs include increasing training funding, expanding training coverage, increasing the frequency of organizing training, and strengthening the allocation of extra resources. The "Teacher Education Revitalization Action Plan (2018-2022)" (Ministry of Education et al., 2018) document stipulates that kindergartens, primary and secondary schools, and secondary vocational schools shall arrange teacher training funds at 5% of the total annual public budget. In the interviews, many teachers said that the shortage of school funds has caused many teachers to be unable to reimburse the basic expenses for outside training. The school itself lacks enough financial strength to set up a special training fund. The shortage of funds has dramatically restricted the power of training. A series of training intensity problems, caused by insufficient funding of training, include limited training coverage in schools, a low frequency of participation in the activity, and incomplete allocation of additional resources (Fu, 2020).

The researchers considered that insufficient investment to explain all kinds of development difficulties in border areas has been involution. The border areas are used to the "extrapolation" development mode, caused by people's long-term poverty and backward economic development in the past. The thinking inertia of "waiting, relying on and asking" has been solidified in the concepts of school administrators and teachers in border areas.

Today, border areas are not necessarily poor areas. With the implementation of the Belt and Road (B&R)*, the interaction between China's border areas and neighboring countries has contributed to the growth of wealth and the accumulation of international social capital. According to the experience of endogenous growth theory (Krueger & Lindahl, 2001), it is necessary to change

* The Silk Road Economic Belt and the 21st Century Maritime Silk Road are referred to as the One Belt One Road (standard English abbreviation B&R), which is a transnational economic belt initiated and led by the government of the People's Republic of China in 2013, which is of great significance to the development of China's border areas.

the thinking inertia of the development of border areas. The government should plan and promote the cooperation between education and business, and obtain social capital to participate in the development of border education. The government and schools improve teachers' quality to transform social capital in border areas into teacher human capital and augment the economic development of border areas with a high-quality education.

3.1.4. Training Opportunities

Teachers' need for training opportunities is reflected in the need for opportunities for teacher training in small-scale rural schools and the opportunities for substitute teachers to participate in the activity.

The scattered living characteristics of ethnic minorities provide geographical conditions for the widespread distribution of small-scale schools. Teachers in small-scale rural schools generally have the characteristics of "complex and diverse types, separate much training structures, and local and low-level sources" (Liu et al., 2017, pp. 106-115). They are in the "nervous ending" position in the overall teacher team construction system and belong to the marginal group of teacher professional development.

In an interview, a teacher who once taught in a small rural school said: "I used to finish the primary school in the rural area. I came here because the school was withdrawn. The teachers there have almost no training".

Other teachers also said that small-scale schools are usually substitute teachers. Generally, schools have only one or two teaching staff. Once teachers go out for training, the school faces the suspension of classes. Therefore, teachers have very few opportunities and conditions to participate in training.

Previous studies have shown that increasing training opportunities for rural teachers has important practical significance for narrowing the gap between urban and rural students' achievement (Sun & Du, 2021). In allocating training opportunities in urban and rural areas, the department of education should favor small-scale school teachers, who seldom participate in training and take measures such as "post replacement" and "targeted assistance" to solve teacher absences when teachers go out for training.

3.1.5. Training Practicality

The practicality of training is reflected in the practical effectiveness of training and teacher experience. The activity is separated from teachers' evaluation and can only be transformed into a formal teaching performance. Teachers in border areas may feel very contrary to the training experience and practical experience. One participant said: "I feel that their methods are great, but they don't apply here".

Among the interviewees, more than 70% of the teachers said that "the training effect is good", "feels helpful", and they "can learn from their methods". At the same time, more than half of the teachers believe that the training content is out of touch with practice, and there are too many educational methods. Maneuverability is weak. The contradiction between theory and practice significantly reduces teachers' expectations and effectiveness of training.

Experiential training emphasizes that teachers should combine practice and knowledge in the training process (Wu, 2008).

3.2. Influencing Factors of Teacher Training Needs

3.2.1. Subjective Factors

The main factors include the quality of a teachers' professional life, teachers' professional growth, and teachers' professional cognition, which mainly affect the needs of teachers' training form and training content.

The quality of the professional life of teachers in border areas is low, which is mainly reflected in the loss of teachers' spiritual world, fragmented teaching life, the realization of personal values, and the contradiction between ideals and reality. The teaching profession is a complex and sacred profession with multiple role groups. Teachers subconsciously set higher professional development goals for themselves. However, there is a gap between the high standard self-expectation and the reality (Zhong & Jiang, 2020), which makes teachers' self-development experience dilemmas such as mental weakness and the decline of achievement perception threshold with the growth of teaching years.

The endogenous development motivation of teachers needs to be continuously driven by the external environment and the approval of third parties. The form of expert guidance can significantly stimulate teachers' sense of accomplishment in teaching. The state of school-based training can build a teacher's learning community, encourage teachers to link teaching achievements with the realization of personal values, and improve teachers' professional vitality.

Promoting the professional growth of teachers is the gist of teacher training. In recent years, teacher training has gradually transitioned to teacher learning (Chen & Liu 2016), developing from passive acceptance, to active learning. This study shows that teachers in border areas still need to be trained "passively" because they have weak professional knowledge and intense awareness of self-improvement but they lack ability. For example, teachers have a negative attitude towards participating in scientific research, indicating that "we don't understand scientific research" and "have no one to guide us".

Professional cognition includes the professional ethics, cognition of professional ideals and beliefs, and professional emotional experience of teachers in border areas. The decreased teachers' professional awareness will cause professional alienation. Occupational burnout is a common emotion that appears with the increase of teachers' years of employment. Occupational alienation and job burnout affect teachers' development motivation. By analyzing the interview content of 13 teachers, it is found that young teachers have serious job burnout.

Some teachers want to take the civil service examination as soon as they are employed. It may be that becoming a teacher is just a transitional choice when facing the pressure of graduation and job hunting. The problems of teacher burnout, lack of motivation for development, and a lack of career planning originate from teachers' professional cognitive dilemmas. To strengthen the

professional cognition of in-service teachers, it is necessary to add professional goals, professional development positioning, professional careers, and mental health courses in teacher training.

3.2.2. Organizational Development and Institutional Environmental Factors

The prerequisite for the survival and development of any organization must be an adaption to the external environment. The institutional environment is the primary and decisive factor for the development of any school organization (Chen & Huang, 2018); the relationship between the two factors constitutes the elements of organizational development and the institutional environment that affect the training needs of the teachers.

The results of this study show that, firstly, the teacher learning community, home-school relationship, and school management concepts constitute the essential elements of the organizational development of border schools, which affect the strength of the organization and the implementation of training. An essential basis for forming a teacher learning community in schools is implementing "teacher-oriented" school-based training. The presentation of school-based training is a specific practice that the school is in a central position to offer and the driving force is to promote the professional development of its teachers. At present, schools in border areas have solid external dependence on promoting teacher development, while the interactive learning space between teachers in schools and the communication space between teachers and parents outside schools have not been well exploited and utilized. Therefore, the implementation process of school-based training in border schools presents a recurring situation of "positive beginning, weak midfield, and declining end", resulting in teachers who can only rely on external training for development. This kind of external training dramatically reduces the training intensity.

Secondly, the teacher management system and the material security system constitute the external institutional environment for the development of the school organization, which affects the tendency of training opportunity distribution and training coverage.

It is mainly reflected in two aspects. On the one hand, the distribution of training opportunities is unbalanced, which cannot cover the elderly teachers in rural schools (referring to teachers aged about 55). This is different to the general understanding that the older the teachers are, the more valuable they are. In rural schools in border areas, the vocational competitiveness of the elderly teachers is in a weak position compared with the young teachers. The benefits obtained by older teachers participating in the training are lower than younger teachers. Therefore, schools tend to be more inclined to young teachers when allocating training opportunities based on the principle of maximizing benefits.

On the other hand, the training coverage rate refers to the coverage in the sense of physical space. Schools with more abundant financial resources can often provide financial support and logistical support for teachers to go out for training. According to research, schools in border areas have not yet been able to guarantee

the input of "5% of annual training funds" (Ministry of Education et al., 2018) required by the state. There are still difficulties in material security.

3.2.3. Field Culture Factors

The field culture of a border area is based on the unique social temperament formed by the natural border environment, national cultural history, and development history. The key to the impact of cultural factors on the practicability of training in border areas is that teachers are in an atmosphere that emphasizes business and derides education.

Cross-border trade is developed in the border areas, and many families are engaged in the trade industry, and the economic benefits are considerable. Since the 21st century, they have experienced a rapid expansion of wealth from poverty to wealth. The enormous financial gains have impacted people's psychological perceptions. Local people have gradually transformed their perceptions from "education changes destiny" to "education is useless". This kind of cognition breaks the main idea of the past that relied on education to get rid of poverty.

The frontier groups do not need to change their lives through education (Wang & Ye, 2020). The concept of "emphasizing business over education" is typical in border areas. Teachers believe that the current teaching environment is not as good as before.

One teacher said: "Parents think it makes no difference whether children go to school or not".

A senior middle school teacher felt very embarrassed: "Many plans cannot be realized with such a source of students and such a working environment".

The facts show that many pieces of training tend to inspire teachers more than to teach practical knowledge. The field culture of "valuing business and devaluing education" has created an increasingly harsh working environment for teachers, which dramatically compromises the practicality of training.

4. Strategies for Teacher Training Reform

Based on the "Teacher Training Demand and Its Influencing Factor Model" constructed in the previous section, this study proposes three optimization strategies for teacher training problems in border areas:

Firstly, more attention should be paid to the quality of life of teachers in border areas. Teachers provide specialized mental health-related courses and consulting services. The mental health of teachers directly affects the success or failure of teachers' work and indirectly affects the level of students' mental health. More importantly, it weakens the life value of teachers as people, not just educators and employees (Wu, 2020). Therefore, the goal and content positioning of the teachers' mental health curriculum is to enable teachers to have an optimistic work attitude, a relaxed and happy teaching experience, be open-minded and have open emotions, and perseverance. At the same time, it provides, but is not limited to,

an interactive psychological consulting platform and online psychological consulting channels for teachers.

Secondly, school-based training should be developed, and a teacher learning community should be constructed. Regarding the school as the basic organizational unit and the county as the organization group, they should pay attention to the on-demand training of teachers' teaching needs and promote teachers "teaching skills"; introduce regular visits of experts into the school for on-site guidance to solve the real-time difficulties of teachers; strengthen the participation of teachers in scientific research in border areas; encourage teachers to participate in scientific research activities and hire experts for guidance.
Thirdly, exceptional training programs can be planned to create the international influence of border education and strengthen teachers' professional honor and achievement threshold. There should be a focus on the direct emotional bond between the brand's nationality and ethnicity and teachers.

5. Conclusions & Limitations

The findings in the research can be summarized as follows:

- The demand for teacher training, and its influencing factors, show a five needs and three-factor structure.
- Among the three factors that affect the demand for teacher training, the main factor is the most critical and direct factor that affects the need for teacher training; organizational development and institutional environmental factors are used as intermediary factors for training institutions to affect the demand for teacher training. Also, the impact of teacher training needs is relatively small, which is an indirect factor.
- The training needs cannot be determined by any one of the three factors alone, but are often the result of the interaction of the three factors, and they form a triangular interactive relationship.

Despite the strengths of this research, it still has certain limitations. Firstly, the researchers found in the interviews that some teachers could not respond clearly on teachers' professional development. The reason is probably that those teachers' impression of the concept of "professional development" was vague, and the researchers converted "professional development" into "teacher" on the spot. Questions such as "knowledge and teacher's ability" are defined as "(unanswered)" after repeated consideration during the recording translation stage. Therefore, the relationship between teachers' professional cognition and influencing factors is somewhat blurred. Future research can pre-work related concepts for teachers so that the teachers can understand professional concepts in advance.

Secondly, this research is about the analysis of teachers' training needs in border areas, and most of the border areas in China are inhabited by ethnic minorities; the influence of ethnic, cultural values is not taken into account in the research design.

Qualitative analysis has a certain degree of subjectivity, and this subjectivity comes from the subjectivity of researchers' transcendental values and empirical data. Future research can do a quantitative study based on "the model of teacher training needs and its influencing factors in border areas" to test the conclusions of this research and reduce the subjective influence of researchers.

At the same time, through quantitative analysis, the weight of the five training needs in the model and the power of the three influencing factors can be judged.

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Appendix 1. Interview Protocol

1. Have you been working in the border area?
2. Why did you choose to be a teacher in a school in the border area?
3. Do you take the initiative to learn after work? What is the main learning content?
4. What type of training have you attended?
5. What impact will this training have on your teaching and professional development?
6. Where does the training funding support come from?
7. In terms of teacher professional development, what support do you think teachers need?