

# Problems of Unbalanced Teacher Quantity and Quality and Countermeasures

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**Abstract:** This paper focuses on the quantity and quality of teachers. For a long time, the supply of teachers has been a topic of concern in the academic circles. There are too many people in developed cities, and it is common for underdeveloped rural areas to have no applicants. The quality of teachers is mainly reflected in the qualifications of teachers, and the uneven distribution of teachers' qualifications is also a very common phenomenon in schools at different levels in different regions. By combing the existing data, this study found that there are still many problems in the number and quality of teachers, and found out the reasons behind them. Finally, it proposed a feasible path for the problems and reasons.

**Keywords:** Number of Teachers, Quality of Teachers, Educational Imbalance, Educational Equity.

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## 1. Introduction

The principal contradiction in our society has been transformed into the contradiction between the people's ever-growing needs for a better life and unbalanced and inadequate development. In the field of education, education in different regions, groups, and schools still faces the problem of imbalance and inadequacy. It is necessary for governments at all levels to gather forces from all walks of life to develop fair and quality education. Against this background, in view of the extreme shortage of educational resources, a highly concentrated "city priority" educational resource allocation model is adopted. The government's investment in education, school conditions, and teacher allocation have always been inclined to cities. The post-urban education resource allocation system in rural areas has directly led to the gap in the allocation of educational resources between urban and rural areas in my country.

[1] Educational resources include many aspects, among which the uneven distribution of teacher resources is more significant and needs attention. In terms of teacher resource allocation, the quantity and quality of teachers has always been a topic of concern in the academic circles. In different districts and counties, the supply and demand of teachers are inconsistent. In economically developed areas, the ratio of teachers to applicants is relatively high, and it is difficult to test the number of teachers. Many people even choose to work as temporary teachers and continue to prepare for the exam. In economically underdeveloped areas, especially in rural areas, it is often impossible to recruit teachers, and the state needs to adopt policies such as special post plans and excellent teacher plans to motivate and guide students to teach. In addition, the distribution of the quality of teachers in different regions is also uneven. Teachers with high education often choose to work in economically developed areas, while teachers in economically underdeveloped areas often have less education. In short, the unbalanced development of teachers' quantity and quality is a topic worthy of research and attention. This study studies the imbalance of teachers' quantity and quality through combing, and seeks solutions.

## 2. Literature Review

The policy of balanced allocation of teacher resources is the action basis and criterion for the allocation of teachers. Domestic policy research on the balanced allocation of teachers mainly focuses on the quantity and quality of the balanced allocation of teachers. At the same time, the researchers sorted out the support policies for the allocation of teacher resources, and presented the support provided by my country for the balance and full development of teacher resource allocation in a clearer context.

One is the difference in the number of teachers. Most scholars believe that the teaching staff in the eastern region of my country is relatively strong, while the rural teaching staff is relatively weak. Second, the quality of teachers is different. According to relevant surveys, the overall quality of teachers in rural areas is lower than that in urban areas. Their educational ideas are backward, their teaching methods are single, and their knowledge update speed is very slow. [2]

In terms of the supply of teachers, the measurement standard is generally the student-teacher ratio. Generally speaking, the more sufficient the supply of teachers, the smaller the student-teacher ratio. In a class, each student can get more Educational attention, thereby improving their academic performance. In the case of teacher shortage, schools generally adopt the following methods: recruit unqualified substitute teachers, expand the classroom size, increase the teaching time of existing teachers, cancel some non-uniform examination subjects to reduce the demand for teachers. [3]

In terms of the supply of teachers' quality, teachers' teaching experience and teachers' qualification certificates are generally used to measure the quality. However, the problem we are currently facing is that the measurement of teaching experience is relatively complicated, and the increase in teaching experience does not mean the improvement of teaching experience. Similarly, most of the teaching teachers in the series have teacher qualification certificates. Therefore, in our country, neither of these two indicators can measure the supply of teacher quality well. Regardless of whether they have teaching experience or whether they have obtained a teacher qualification certificate, there is no obvious difference in this index between schools. When comparing the

differences in the quality of teachers between schools, some studies have used the academic level of the school's teaching staff as a representative indicator, and the educational level of teachers is an important input indicator for evaluating the quality of running a school. [4] In addition, there are indications that teachers with high levels of education are more conducive to "learning excellent students" and "improving excellence", and are better able to "teach students in accordance with their aptitude". [5]

In terms of the quantity and quality of teachers, it is necessary to further sort out the existing problems and seek countermeasures and suggestions to solve the problems.

### 3. Analysis of the Current Situation of the Quantity and Quality of Teachers

This paper uses the number of teachers (student-teacher ratio, number of full-time teachers) and teacher quality (education) to measure the main indicators of teacher resource allocation. The data comes from the 2012-2020 "China Education Statistical Yearbook".

#### 3.1. The distribution of the number of teachers

**Table 1.** Statistical Table of Student-Teacher Ratio in Regular Schools at All Levels from 2012 to 2020

Year	Ordinary primary school	Ordinary junior high school	Normal high school	Secondary vocational schools	Common colleges and universities		
					Nationwide	Undergraduate institutions	Academy
2012	17.36	13.59	15.47	24.19	17.52	17.65	17.23
2013	16.76	12.76	14.95	22.64	17.53	17.71	17.11
2014	16.78	12.57	14.44	21.34	17.68	17.73	17.57
2015	17.05	12.41	14.01	20.47	17.73	17.69	17.77
2016	17.12	12.41	13.65	19.68	17.07	16.78	17.73
2017	16.98	12.52	13.39	19.59	17.52	17.42	17.74
2018	16.97	12.79	13.10	19.10	17.56	17.42	17.89
2019	16.85	12.88	12.99	18.94	17.95	17.39	19.24
2020	16.67	12.73	12.90	19.54	18.37	17.51	20.28

As can be seen from

Table 1, the student-teacher ratio in schools at all levels shows a downward trend overall, while that in general colleges and universities shows an upward trend. From the perspective of schools at different levels, the student-teacher ratio in ordinary primary schools is basically around 17, showing a downward trend as a whole, indicating that the student-teacher ratio in primary schools has been optimized; the student-teacher ratio in ordinary junior high schools fluctuates around 12.7, which is relatively stable overall; The teacher-teacher ratio has dropped significantly in recent years,

from 15.47 to 12.9, and the structure has been significantly optimized; the student-teacher ratio of secondary vocational schools has dropped from 24.19 to about 19, and the student-teacher ratio has been optimized, which is conducive to the development of secondary vocational schools; The ratio of students to teachers in undergraduate colleges in ordinary colleges and universities has not changed much, while the ratio of students to teachers in junior colleges has increased, from 17.11 to 20.28. It is necessary to pay attention to the optimization of student-teacher ratio.

**Table 2.** Statistical table of the number of full-time teachers in schools of all levels and types from 2012 to 2020 (unit: 10,000 people)

Year	Ordinary primary school	Ordinary junior high school	Normal high school	Secondary vocational schools	Common colleges and universities		
					Nationwide	Undergraduate institutions	Academy
2012	558.55	350.28	159.50	88.10	144.03	101.4	42.34
2013	558.46	348.00	162.90	86.79	149.69	105.5	43.66
2014	563.39	348.77	166.27	85.84	153.45	109.17	43.83
2015	568.51	347.51	169.54	84.41	157.26	111.64	45.46
2016	578.91	348.73	173.35	83.96	160.20	113.40	46.69
2017	594.49	354.82	177.40	83.92	163.32	115.05	48.21
2018	609.19	363.87	181.26	83.35	167.28	117.43	49.77
2019	626.91	374.71	185.92	84.29	174.01	122.53	51.44
2020	643.42	386.04	193.32	85.74	183.30	127.61	55.64

It can be seen from Table 2 that, except for secondary vocational schools, the number of full-time teachers in schools at other levels has increased, but with varying degrees of increase. From the perspective of different school levels, the range of the number of full-time teachers in ordinary primary schools is 84.96. In recent years, the number of full-time teachers has been on the rise, with a maximum increase of more than 15%. The number of teachers in primary schools is sufficient; the number of full-time teachers in ordinary

junior high schools has increased from 350.28 increased to 386.04; the range of the number of full-time teachers in ordinary high schools was 33.82, an increase of 21.20%, and the number of teachers in high schools was effectively guaranteed; the number of full-time teachers in secondary vocational schools showed a slight decline, and the issue of teacher replenishment needs to be paid attention to; the number of full-time teachers in ordinary colleges and universities The increase rate is obvious, with a range of 39.27

and a maximum increase of 27.27%, of which undergraduate colleges increased by 26.21 and junior colleges increased by 13.3.

It can be seen from Figure 1 that the overall academic qualifications of colleges and universities are getting higher and higher, and the proportion of teachers with doctoral

degrees has shown a significant upward trend; the proportion of teachers with master's degrees has also increased; the proportion of teachers with bachelor's degrees has dropped significantly.

### 3.2. The Quality of Teachers

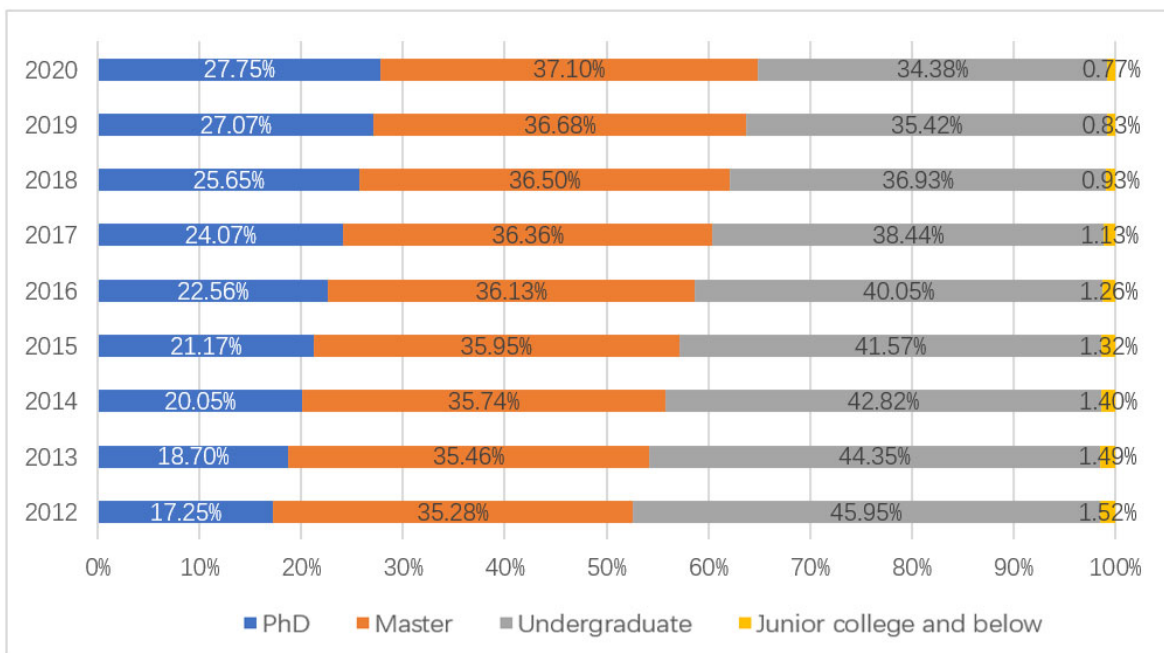


Figure 1. Statistical chart of academic qualifications of teachers in colleges and universities

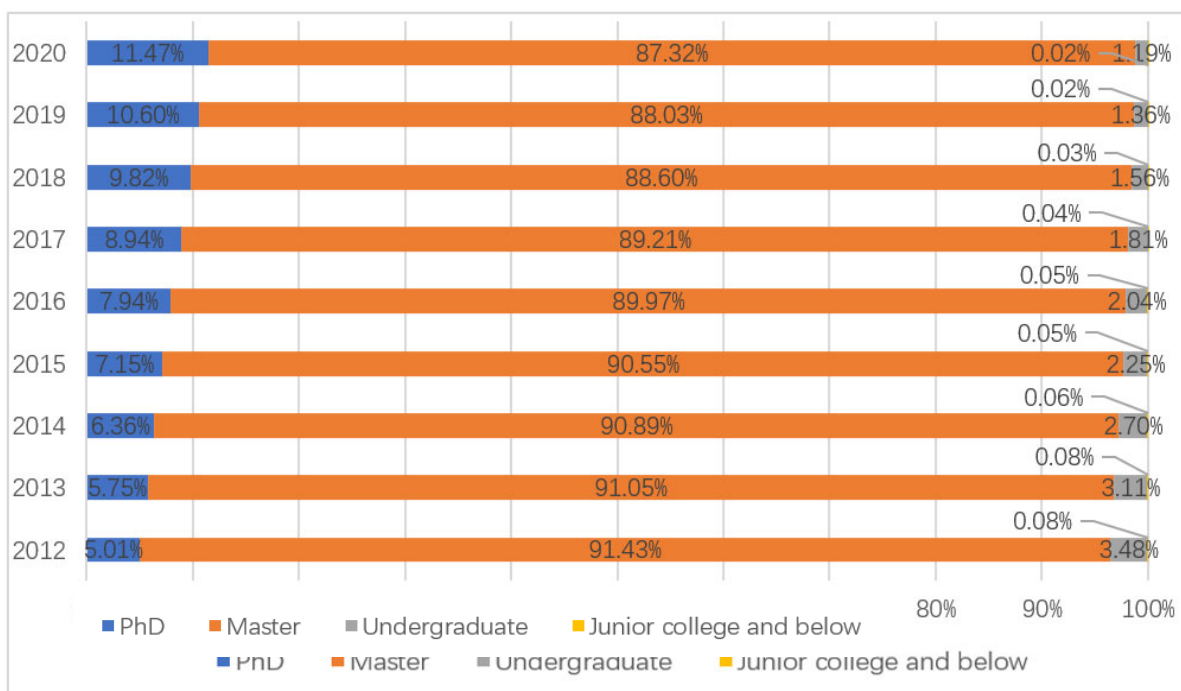


Figure 2. Statistical chart of ordinary high school teachers' academic qualifications

It can be seen from Figure 2 that, on the whole, in general high schools, teachers' academic qualifications are getting higher and higher, and the proportion of teachers with graduate degrees shows a significant upward trend; the proportion of teachers with undergraduate degrees has declined, but still accounts for the vast majority; The proportion of teachers has dropped significantly. The quality of high school education is affected by factors such as teacher quality and school facilities. School facilities can be improved

quickly by increasing investment. Improving teacher quality is not an overnight achievement. In the process of popularizing high school education, if the quality of teachers does not improve, it will seriously hinder the improvement of the teaching quality of high school education, resulting in low-level popularization. [6] The popularization of high school education is firstly to popularize enrollment and finally to improve the quality of education. The popularization of high school education, especially the reform of the new

college entrance examination and the selection of courses in schools, has caused high school education to face the dual

dilemma of low quantity and quality.

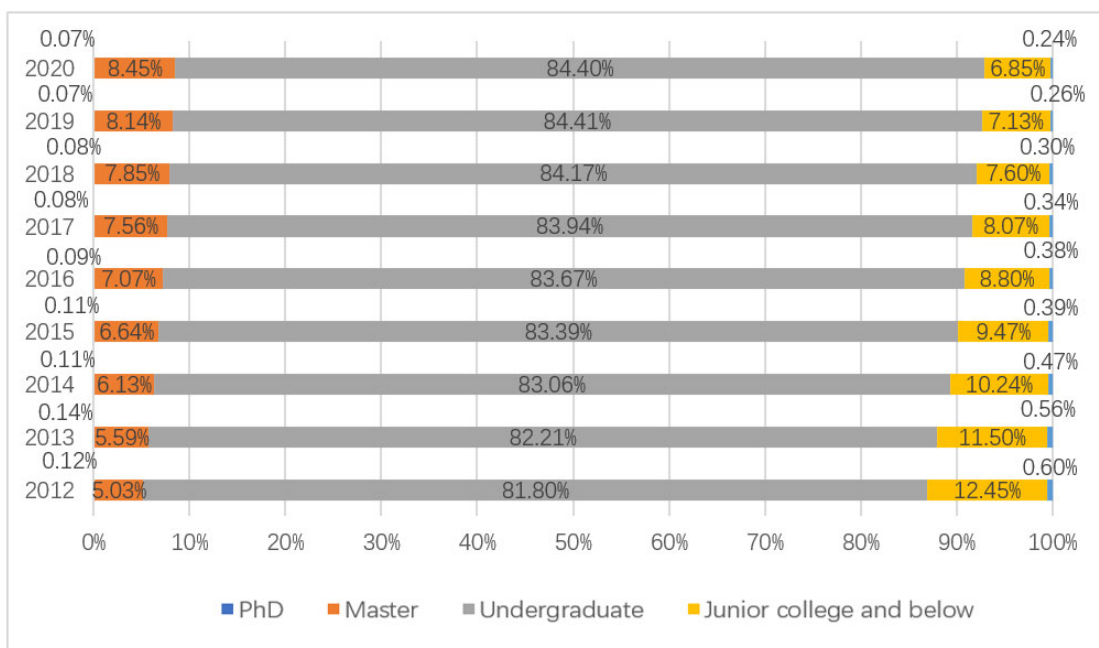


Figure 3. Secondary vocational school teachers' education statistics chart

It can be seen from Figure 3 that in secondary vocational schools as a whole, teachers' academic qualifications are getting higher and higher, the proportion of teachers with doctoral degrees is declining, and the proportion of teachers with master's degrees is increasing; the proportion of teachers with bachelor's degrees has increased. Accounted for the vast majority; the proportion of teachers who graduated from junior colleges has dropped significantly.

It can be seen from Figure 4 that, on the whole, teachers in ordinary junior high schools have higher academic qualifications, and the proportion of teachers who graduated

from postgraduates shows a significant upward trend; the proportion of teachers who graduated from undergraduate degrees has increased, accounting for the vast majority; The proportion dropped significantly.

It can be seen from Figure 5 that, in general primary schools, teachers' academic qualifications are getting higher and higher, and the proportion of teachers who graduated from postgraduates shows a significant upward trend; the proportion of teachers who graduated from undergraduate degrees has increased, accounting for the majority; Significant decline, from more than 50%, down to nearly 30%.

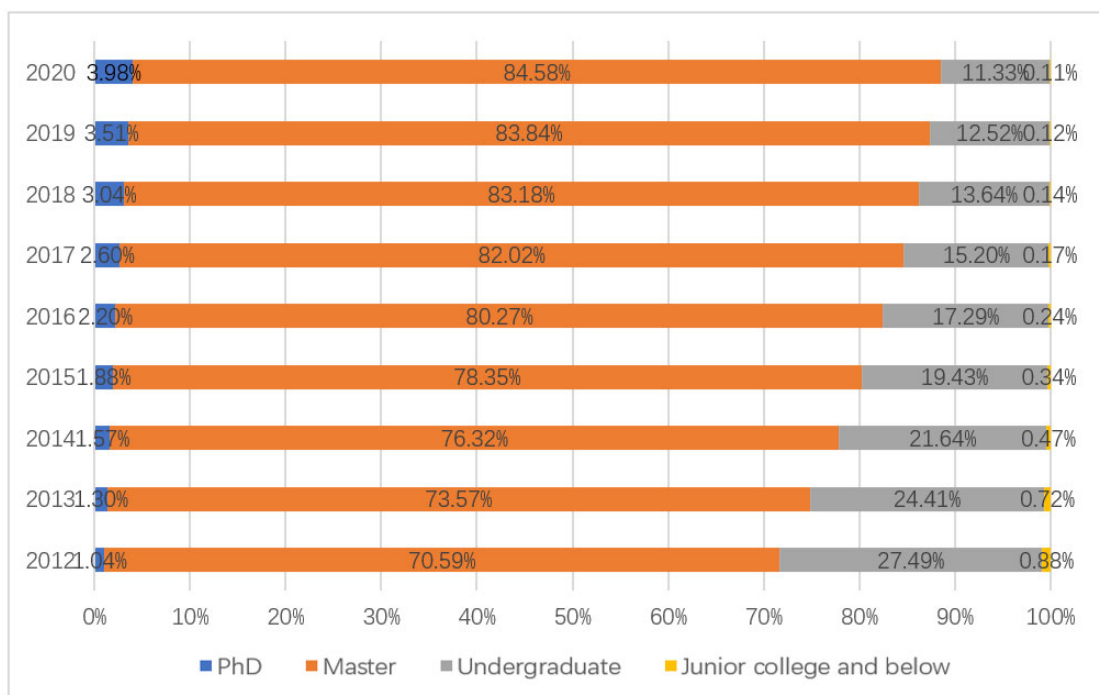


Figure 4. Statistical chart of ordinary junior high school teachers' academic qualifications

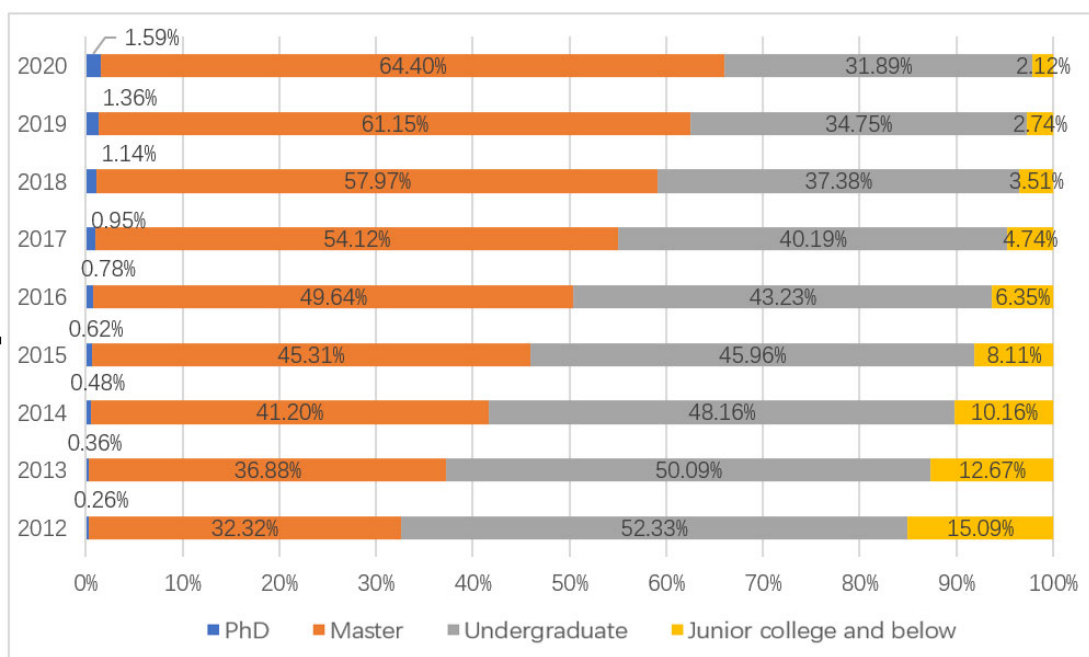


Figure 5 Statistical chart of ordinary primary school teachers' academic qualifications

## 4. Problems and Challenges in The Quantity and Quality of Teachers

Through literature review, it is found that the reasons for the insufficient level of teacher allocation mainly come from complex reasons such as top-level design deviation, teacher management theory deviation from reality, professional treatment rights and interests distortion, and teacher growth system.

### 4.1. The number of configurations is relatively balanced overall, but teachers are still in short supply in some areas

Schools in remote mountain villages still face shortage of teachers and difficulty in recruiting, and there is a contrasting shortage of teachers in county-level primary schools. Generally speaking, county primary schools have basically reached a balanced level, but just looking at a certain value may be "averaged" by other data, and more data is needed to dig out some local and specific problems, rather than just looking at the whole, ignoring the fact that there is a shortage of teachers in some remote mountainous areas.

Insufficient number of teachers in township junior high schools affects the curriculum and teaching quality. There is not much difference in the teacher-student ratio in junior high schools. On the contrary, due to the support and promotion of teacher policies in the past two years, educational resources and school conditions are relatively sufficient and good. The allocation of teachers in urban and rural areas is also relatively balanced. Therefore, there is not much difference in the teacher-student ratio in urban and rural junior high schools. On the contrary, due to the support and promotion of teacher policies in the past two years, the teacher-student ratio indicator level is slightly higher than the county level. Although the overall indicators have reached a high-quality and balanced level, the survey found that the number of junior high school teachers in townships coexists with the phenomenon of excess and shortage. The level of teacher allocation in urban and rural junior high schools continues to be optimized. The teaching management and curriculum

teaching tasks of rural junior high school teachers are relatively large. The class-teacher ratio in urban and rural junior high schools is relatively balanced, and the level of teacher allocation is relatively high.

### 4.2. The quality of configuration is gradually improving, but the level of professional development of teachers continues to be limited

There is a large difference in the education level of teachers in compulsory education between urban and rural areas, and the education level of teachers is relatively low. The "Teachers Law" clearly stipulates that the minimum education requirements for elementary school teachers and junior high school teachers in the compulsory education stage are secondary normal and higher normal majors. However, in order to continuously improve the quality of education, it is far from enough to meet the minimum education requirements, and the education qualifications of teachers must be further improved. Compulsory education schools should focus on cultivating undergraduate teachers with comprehensive quality and professional quality. In order to improve the quality of compulsory education, the academic level of teachers should be gradually raised to the undergraduate level.

Most teachers obtain academic qualifications through non-formal learning methods, such as adult education, self-study examinations, etc., and the knowledge level is lower than that of full-time education. At the same time, many teachers' academic qualifications are not only to improve their teaching knowledge, but also to improve their own academic qualifications in order to obtain professional titles, promotions, salary increases, welfare benefits and even "escape" from school. It can be seen that education is facing problems such as a large gap in educational background between urban and rural teachers, low level of knowledge, and low level of academic knowledge. The academic qualifications of school teachers at all levels are improving as a whole, but the progress is uneven, and the academic qualifications of primary and secondary school teachers still need to be further improved; the academic qualifications of

secondary vocational colleges are generally not ideal, and graduates need to be encouraged to join the teaching team of secondary vocational education.

The difference in professional titles between urban and rural teachers has narrowed, but it is more difficult to evaluate and hire rural teachers. Existing studies have shown that there is not much difference in the level of teachers' professional titles between urban and rural areas, which shows that in recent years, county schools have vigorously promoted the biased policy of giving priority to teachers' professional titles, which has promoted the level of teachers' professional titles to a certain extent. However, according to actual research, although there is no significant difference in the level of professional titles of teachers between urban and rural areas, teachers still encounter some difficulties in the evaluation and employment of professional titles in educational practice.

The teacher's subject background and educational knowledge concept originate from the professional learning process. The higher the professional level, the higher the level of educational original knowledge literacy, the more conducive it is for teachers to adapt to teaching practice and improve teaching effectiveness. In the field of education, due to the lack of school resources and remote location, it is difficult to recruit teachers with high professional level. In order to ensure the normal teaching, the academic qualifications and subject standards of teacher recruitment must be lowered, which is not conducive to the improvement of education quality.

Especially in the training of teachers in village primary schools, in order to quickly replenish the school's teachers, a large number of "general subject teachers" and special post teachers were trained to make up for the shortage of teachers. Although the level of professional counterparts of primary and secondary school teachers in the survey is higher than that of county primary schools, the proportion of general subject teachers is relatively high. In theory, general subject teachers can be competent for all primary school courses, and the professional setting is corresponding. However, special post teachers have many majors, even cross-professionals, with low subject background and teacher quality, and lack of professional knowledge and ability. These problems directly lead to the irregularity and specialization of course learning, which affect the effect of course learning.

## **5. Quantity and Quality Optimization Strategies for Teachers**

The development of education depends on the allocation of teaching staff, and the degree of development of teaching staff directly affects the actual effect of education. In the process of deepening the reform and development of compulsory education in urban and rural areas, education is facing developmental problems such as insufficient teacher supply, quality needs to be improved, structure needs to be improved, team stability is poor, and career satisfaction is relatively low. This article attempts to propose strategies to optimize teacher allocation based on the principles of fairness balance, difference balance, opportunity equality balance, and effectiveness balance, as well as the practice path of teacher quantity and quality, in order to promote the quality balance of urban and rural teacher resources.

### **5.1. Focusing on teachers and cultivating good teachers with "four qualities"**

First, improve the teacher staffing and supplementary mechanism education plan, teacher-oriented. The key to the fair development of education is to create a team of high-quality professional teachers with noble morality, professional skills, reasonable structure and full of vitality. First of all, under the uniform establishment standards of urban and rural areas, preference is given to remote schools, and school teacher allocation can be carried out in a combination of student-teacher ratio, class-teacher ratio, and department-teacher ratio. It is also possible to set up a mobile establishment on the basis of a fixed establishment, which is convenient for assigning teachers to teach in remote areas, schools with a severe shortage of subject teachers, and areas where schools are withdrawn and adjusted, and effectively solve the problem of tight school establishments. Secondly, based on the actual situation, the county-level education administrative department scientifically formulates and publicly recruits teachers according to the sum of the natural attrition of teachers, the number of teachers required to expand the scale of running schools, and the shortage of teachers in the structure; , "Special Post Program", "Silver Age Program", "Excellent Teacher Program" and other national special programs to allocate teachers reasonably. Use public funds for directional training, on-the-job refunds, etc. to train and supplement primary school general subject teachers, junior high school "one-specialized and multi-skilled" teachers, and weak subject teachers. Finally, the establishment department, together with the education department, increases the proportion of middle and senior professional and technical positions in schools year by year in the post setting and professional title evaluation of public institutions, and expands the development paths of teachers. According to the actual situation of the construction of teachers in ethnic minority areas, formulate and implement corresponding incentive policies to attract more outstanding talents to join the educational cause in ethnic minority areas. [7] Strengthen the guidance of students in school, publicize the "four hases" good teachers, so that more interested students can devote themselves to the education cause and teach in places where they are needed. Scientifically allocate compulsory education teaching resources and build a high-level teaching staff. For the teacher staffing system, establish a dynamic adjustment mechanism consisting of provincial-level overall planning, municipal-level overall planning, county-level overall planning, and county-level overall planning and allocation, and establish and improve various mechanisms such as turnover staffing, mobile staffing, and labor service purchases to supplement teachers and employees. [8]

Second, improve the teacher management and employment mechanism Scientific teacher management and employment mechanism is the core of stimulating the vitality of the teaching staff. First of all, establish a special fund for teacher training, and allocate 2.5% of the total salary of teachers as training funds every year. Primary and secondary schools must strictly implement 5% of teacher training funds to ensure teacher training funds; at the same time, through "National Training", "Provincial Training" and Measures such as "city training" promote the quality improvement project of teachers in rural primary and secondary schools, and continuously improve teachers' legal literacy,

professional literacy, subject literacy and educational literacy. Secondly, establish a teacher professional development support service system to give full play to the training, guidance, driving and guiding role of county-level teacher training institutions; establish a "follow-the-job learning" mechanism to promote normal students, especially public-funded normal students, to practice in rural schools; For the teacher training work in the western region, improve the practicality, foresight and pertinence of the training content, pay attention to the training of new ideas, new policies, new curriculum standards, new teaching materials, etc., and promote the professional growth of teachers. Solidly promote the tenure system, tenure system, and urban-rural exchange system for primary and secondary school principals, and strengthen the construction of cadre teams in weak schools.

Third, increase investment in teachers' education and continuously improve teachers' treatment, so that teachers can teach with peace of mind, carefully, enthusiastically, and comfortably. Strengthen interdepartmental collaboration, establish a scientific and reasonable teacher salary increase mechanism, and ensure that the salary of primary and secondary school teachers is not lower than the average salary level of local civil servants in accordance with the law, and gradually increase. Comprehensively use all kinds of teacher allowances from the central, local and departmental departments to encourage teachers to teach in weak schools; try out the "doubling" plan for teachers' income in areas where conditions permit, and encourage excellent teachers to teach in schools; guide social funds to donate to teach and reward outstanding teachers. Finally, the education department will work with relevant departments to formulate specific management measures. Medical institutions and social institutions will provide convenience for teachers, and teachers will give priority to travel and medical treatment.

## **5.2. Improve the teacher allocation plan and improve the teacher allocation management mechanism**

Starting from the concept of high-quality and balanced development, local governments should give preference to schools, especially small-scale schools, in the process of teacher allocation, narrow the gap between urban and rural teacher resources, provide better teachers for education and teaching, and accept better education and teaching. In the true sense, the allocation of teacher resources is optimized.

Humanistic care, building a benign management method for teachers. In 2020, the Central Committee of the Communist Party of China and the State Council clearly stated in the "Opinions on Doing a Good Job in the Key Works in the "Sannong" Field to Ensure the Realization of a Comprehensive Well-off Society as Scheduled" to "fully implement the 'county-management-school-employment' of teachers in the compulsory education stage." The deployment and exchange of teachers under this mechanism mainly depends on the coercive administrative power, but at the same time it needs more humanized care. The teaching and living environment of teachers is relatively simple, and the level of

comprehensive treatment is not high. To be able to engage in the teaching profession for "many years like a day", you must have the qualities of dedication and enthusiasm. For some school posts assigned to remote areas and poor conditions, relevant departments should give them more economic and spiritual care within the scope allowed by the policy.

Improve the management system of the teaching staff and build a dynamic and static establishment mechanism. Gradually implement the teacher management system of "county management and school employment", strengthen the overall management of teachers, establish a dynamic and static staffing mechanism, and innovate the "turnover pool" system for teacher staffing to meet the needs of teacher staffing. Static staffing is based on student-teacher ratio and class-teacher ratio as the main verification criteria, while dynamic staffing is adjusted according to the staffing needs of each school and the workload of teachers, and gradually promotes the reform of the integration of urban and rural teacher staffing. Rationalize the tilt, and make centralized adjustment and fine-tuning of the establishment according to the change of the student source within the specified number of years, so as to realize the scientific and flexible management of urban and rural teacher allocation standards. It is necessary to timely adjust the urban and rural population dynamics and school running conditions, adjust the number and structure of dynamic staffing and static staffing, provincial units adjust once every two to three years, and cities and counties make timely adjustments according to recruitment needs.

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