

# Educational Equity in the Age of Artificial Intelligence—Taking the Construction of Rural Teachers as an Example

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There are some problems in the construction of rural teachers in the era of artificial intelligence: (a) obvious dualization of resource allocation; (b) shortage of teacher resources; (c) the irrationality of subject structure; and (d) professional quality are not high. Correspondingly, the upsurge in the era of artificial intelligence is used to optimize resource allocation and bridge the digital divide. Promote the two-way flow of urban and rural teachers and realize the integration of urban and rural teachers. The university cooperation linkages optimizes the discipline structure and improves the training mechanism of rural teachers, promote the professional quality of rural teachers and other ways to promote the construction of rural teachers so as to promote educational equity.

*Keywords:* rural teacher team construction, artificial intelligence, education fair

## Introduction

In 2015, the state issued *The Support Plan for Rural Teachers (2015-2020)*, which takes the construction of rural teachers as an important strategic basis for realizing the modernization of education, which is of great strategic significance for improving the status of teachers and promoting the fairness of China's educational cause. In February 2019, the Central Committee of the Communist Party of China and the State Council prioritized the strategic task of Education Modernization in China 2035, to minimize and balance the gap between urban and rural education, and to improve the national education level. The establishment of an excellent team of rural teachers will become the core force of rural education reform and development, so as to promote educational fairness and ultimately achieve educational modernization. Nowadays, the world has ushered in the upsurge of artificial intelligence era, and various fields of society are also showing the trend of digital, network-based to intelligent transition. In 2017, the State Council pointed out in *The Development Plan for the New Generation of Artificial Intelligence* that the application of artificial intelligence in education fields, such as teaching, management, and resource construction should be promoted to accelerate the construction of intelligent campuses. In 2018, the Ministry of Education released *The Education Informatization 2.0 Action Plan*. It can be seen that the application of artificial intelligence in the field of education is an important means to promote educational fairness and an important support to realize educational modernization. Artificial intelligence will lead the transformation and upgrading of educational informatization, so as to accelerate the process of educational modernization. In order to realize the modernization of education, it is necessary to make up the shortcomings of rural education and seize the opportunity of the era of artificial intelligence to

maximize the role of modern information technology to promote the construction of rural teachers, so as to promote educational equity.

### **Development Status of Rural Teachers in the Era of Artificial Intelligence**

In the tide of the era of artificial intelligence, all over the country has gradually carried out the deep integration of information technology and education and teaching in order to promote the realization of education modernization, making rural teachers catch up with the trend of the era of the integration of artificial intelligence and education. Sichuan province issued *The Guidance on the Construction and Application Planning of the Public Service System of Digital Education Resources*, stressing the need to continuously promote the “Broadband Network school-school access”. By 2019, in addition to teaching points, the network connectivity rate of primary and secondary schools in the whole province has reached 98%, of which the average access rate of primary and secondary schools in deep poverty-stricken counties is 90%. At the same time, it also emphasized the continuous follow-up of the project of “full coverage of digital education resources in teaching sites”, and equipped the original 9,298 teaching sites with digital education resources receiving and broadcasting equipment, which directly benefited more than 34,000 rural teachers. Gansu province adheres to the teacher-oriented principle, improves the information literacy of rural primary and secondary school teachers, and promotes the in-depth integration of information technology and education and teaching. They carried out a project to improve the application ability of information technology among primary and secondary school teachers, and trained 290,000 primary and secondary school (kindergarten) teachers, accounting for 88.86% of the total number of full-time teachers. They implemented the project to improve teachers’ humanistic quality, and trained more than 300,000 teachers, basically covering all primary and secondary school teachers. Carry out the activity of “one teacher, one excellent lesson, one teacher for each lesson”. Promote modern information technology and improve local teachers’ teaching ability by means of “special post plan”, “teachers supporting teaching”, and “students supporting teaching”. In addition to the linkage of provincial governments, colleges and universities also play an active role. In the work of helping cengong County in Guizhou Province, the University of Electronic Science and Technology has implemented systematic training for backbone teachers of basic education to teach them advanced education concepts in view of the shortage of local excellent teachers. In order to improve the teaching skills of teachers in Chinese, mathematics, foreign languages, and other subjects in local primary schools, more than 1,300 teachers have been trained and 400,000 yuan has been invested by combining short-term training with long-term study, face-to-face guidance, and remote discussion. According to the statistics of the Ministry of education, in 2018, the average equipment value of primary school students in China was 1,558 yuan, an increase of 153 yuan or 10.9% over the previous year. Rural primary schools are equivalent to 75.8% of urban primary schools. The average equipment value of junior high school students in China was 2,453 yuan, 188 yuan higher than that of the previous year, with an increase of 8.3%. Rural junior middle schools were equivalent to 76.0% of urban junior middle schools. The proportion of primary schools connected to the Internet was 97.8%, including 98.3% in urban primary schools and 97.7% in rural primary schools. Ninety-nine percent of junior high schools in China have access to the Internet, 98.2% in urban junior high schools and 99.2% in rural junior middle schools. The allocation of information technology in compulsory education schools has been continuously improved, the coverage of high-quality resources has been gradually expanded, and the gap between urban and rural education information construction has been gradually narrowed, but the existing gap cannot be ignored. In addition, due

to the low information literacy of rural teachers and the neglect of education informatization in rural schools, the integration degree of information technology and education and teaching in rural schools is still very low, gradually forming an invisible gap with the city. Studies have shown that in the era of artificial intelligence, the teaching work pattern of teachers has changed, and the overall trend has shifted from knowledge imparts as the center to personalized and accurate teaching supported by big data, which puts forward new requirements on the role of teachers (Cheng & Kong, 2020). This means higher and higher requirements for teacher specialization. However, in fact, the loss of teachers in rural areas is serious and the willingness to stay is low. In this case, higher requirements are put forward for them instead, which is unrealistic and will further give rise to a series of problems in the construction of rural team in the era of artificial intelligence.

## **The Construction of Rural Teachers in the Era of Artificial Intelligence**

### **Obvious Dualization of Resource Allocation**

On the one hand, resource allocation is reflected in the regional gap, that is, the difference between the eastern and western regions. In 2019, the Ministry of Education released the use of assets in schools in various regions of the country, the number of teaching computer and network multimedia classrooms in Jiangsu Province in the eastern developed province is 905,283, and the asset value of information equipment is 1,379,356.84 yuan. The number of teaching computer and network multimedia classrooms in Guangxi is 308,409, and the asset value of information equipment is 485,655.91 yuan. The gap between the two places is about three times. The number of teaching computer and network multimedia classrooms in Tibet is 17,885, which is 50 times different from that of Jiangsu Province, and the asset value of its information equipment is 12 times different, which is 39,789.31 yuan. The significant difference in resource allocation between the eastern and western regions is bound to aggravate educational inequality. On the other hand, education inequality is reflected in the gap between urban and rural resource allocation. In the process of rural education development, it is always faced with the contradiction between the lack of high-quality education resources and the growing needs of farmers in real life. Although the government supports the development of rural education informatization through the “three links and two platforms” policy, the strength is still limited. According to statistics, in 2018, 67.6% of primary schools and 77.3% of junior middle schools established campus network schools, respectively 3.2% and 0.6% higher than that of the previous year. The proportion of rural primary schools and junior middle schools with network construction was 64.5% and 74.4%, respectively, 18% and 12% lower than that of urban schools. The proportion of compulsory education schools establishing campus network continued to increase, but the gap between urban and rural areas was still large. Under the design concept of giving priority to the development of urban education and then promoting the development of urban and rural vulnerable groups, the pull type differential development indeed further improves the urban education, but the effectiveness in the development of rural education is obviously insufficient. Based on the field survey of 17 districts (cities and counties) in eight provinces of east, central and western China, some scholars found that there are significant differences between urban and rural areas in terms of land use per student, vitality ratio, average book volume per student and average number of multimedia sets in schools (Zhang, 2015a). China’s rural education is not only facing the external problems of how to adapt to the rapid development of artificial intelligence era, but also long-term structural imbalance between rural education and cities. In the case of dual resource allocation, the level of rural teachers using information technology and education is relatively backward, which is not conducive to the construction of rural teachers.

### **Shortage of Teacher Resources**

According to statistics, in 2018, there were 11.31 million teachers in kindergartens, primary schools, and junior middle schools, excluding high schools and universities. Currently, there are more than 2.9 million teachers in rural areas, accounting for only about a quarter of the total. Due to the scarcity of rural teachers themselves, coupled with the serious loss of outstanding backbone teachers in rural schools and the difficulty of introducing and supplementing teachers, the weak attraction of rural schools to teachers and the improper flow of urban and rural teachers restrict the overall vitality of rural teachers (Zhao, 2019). In view of this problem, the state promotes the local government to implement the “special post plan” and the public funded oriented training of normal students, so as to cultivate and import more suitable qualified teachers for rural schools. Take the “special post teacher program” as an example, although it has alleviated the shortage of rural teachers to a certain extent, there are still some problems. Its recruitment policy points out that the main target of recruitment is undergraduate graduates, and a small number of fresh normal college graduates can be recruited. Although the regulation emphasizes the level of academic qualifications, in fact, the special post teachers in rural schools are either undergraduate non normal students or junior college normal students. Therefore, the policy does not ensure the quality of recruitment of special post teachers. At the same time, special post teachers will leave one after another after the expiration of the contract, and even prepare for or take part in various recruitment examinations during the period of post, which does not solve the loss of rural teachers from the root. On the other hand, urban-rural communication is an important way to optimize rural teacher resources. By means of regular communication, cross school competition, integrated management of school districts, and teaching of Township Central School teachers, all localities focus on guiding outstanding principals and backbone teachers to flow to rural schools (Zhang, 2015a), hoping to improve the teaching efficiency of teachers and reduce the burden on teachers. However, in the actual exchange of urban and rural teachers, it is often emphasized that the urban one-way flow to rural schools. Most of these floating teachers are for utilitarian purposes, hoping to promote their professional titles after going to rural schools. Only a small number of them are willing to participate in rural education (Zhang, 2015b). This form of urban and rural teacher exchange cannot solve the problem of rural teacher resource shortage, most of the teachers from the city are just a kind of egoism, regard this kind of communication as a short-term task, so it cannot really integrate into the rural teacher team, and cannot bring substantial help to the construction of rural teacher team.

### **The Irrationality of Subject Structure**

In addition to the shortage of the total number of teachers, the shortage of rural teachers is also reflected in the unreasonable subject structure. Through the investigation of 1032 rural teachers, it is found that 32% of the rural teachers have to undertake three to four teaching tasks, and 28.9% of the rural teachers have to undertake more than four teaching tasks. At the same time, rural teachers work an average of 12 hours a day (Zhang, 2015a). In terms of the total amount, the lack of rural teachers undoubtedly aggravates the unreasonable discipline structure. According to the survey, due to the serious lack of teachers in music, art, sports, and other disciplines in rural schools, teachers in charge of Chinese and mathematics are often forced to undertake additional teaching of music, art, sports, and other disciplines. On the one hand, it brings a great amount of work to the teachers, which makes the rural teachers have job burnout, even lead to the loss of teachers, leading to a vicious circle. On the other hand, the professional level of part-time teachers in music, fine arts, and physical education is not high, which is not conducive to the all-round development of students’ morality, intelligence, physique,

beauty, and labor. Some teachers even replace these subjects with Chinese and mathematics, making them useless. To a certain extent, this kind of education has widened the gap between rural school children and urban children, and eventually led to unfair education. In view of the unreasonable rural teachers, many researchers put forward to cultivate primary school general subject teachers with comprehensive professional knowledge and comprehensive ability and quality (Xiao, 2014). The cultivation of general subject teachers can really improve the professional level of teachers in all aspects, and then rural teachers can teach several subjects at the same time, which also alleviates the problem of unreasonable subject structure of rural teachers to a certain extent. However, the teachers in rural schools are much weaker than those in urban schools. If teachers are required to become general teachers, it will indirectly aggravate the problem of heavy workload and heavy burden of rural teachers. This way of mending the west from the east is undoubtedly a temporary solution rather than a root cause, and it cannot really solve the problems in the construction of rural teachers.

### **Professional Quality is not High**

Teachers' professional quality includes professional knowledge, ability and spirit (Wang & Yang, 2004). On the one hand, compared with urban teachers, rural teachers are limited in their own development due to the limitations of educational background and environment, so there is a problem of low professional quality. In view of this problem, the state began to implement the national training program for primary and secondary school teachers in 2010, aiming to improve the overall quality of rural teachers in the central and western regions. In the implementation of the national training program, distance training is the main form of rural teachers' training, but there are many problems. For example, rural schools do not pay attention to training, while rural teachers also think that training is not of substantial benefit to them, but increase the workload. Therefore, many teachers' training by using the Internet has become a formal task for rural teachers, while at one end of the network, remote training has become formalized and has not been implemented. Therefore, it is impossible to improve teachers' professional quality only in this way. On the other hand, the professional quality of teachers also contains the problem of low information literacy of rural teachers. Although the country has added equipment and funds to the informatization construction of rural schools, rural teachers are faced with the problem that they cannot apply modern educational technology to education and teaching due to the lack of advanced education ideas and information technology level. Therefore, in the notice on the implementation of the national training plan for kindergarten teachers in primary and secondary schools in 2018, the Ministry of Education also stressed that information technology should be taken as a compulsory content in the training, and the information technology application training project should be specially set up to improve the information literacy of rural teachers. However, according to the survey and interview, it is found that the teaching of rural teachers is still based on simple PPT, and even some teachers think that multimedia teaching is too cumbersome and choose not to use it. In this way, even though the country has provided equipment for rural schools, it has not really implemented the education informatization, which has indirectly widened the gap between rural education and urban education, thus leading to unfair education.

### **The Construction Path of Rural Teachers in the Era of Artificial Intelligence**

There are some problems in the construction of rural teachers' team, such as obvious dualistic characteristics of resource allocation, shortage of teachers' resources, unreasonable subject structure, and low professional quality of teachers. Nowadays, the era of artificial intelligence undoubtedly brings an opportunity

for education. If we can skillfully use modern information technology to solve the problems in the construction of rural teachers' team in the era of artificial intelligence, so as to promote the development of rural teachers. The construction of rural teachers team not only brings a new idea to the education reform, but also promotes educational equity to a certain extent.

### **Optimize Resource Allocation and Bridge the Digital Divide**

In the era of artificial intelligence, using modern information technology to promote the construction of rural teachers' team should first solve the problem of resource allocation in rural schools, so that rural teachers can keep up with the trend of the times and catch up with the upsurge of educational informatization in the era of artificial intelligence. In recent years, although the country through the "three links and two platforms" policy to support the construction of rural education information, but the strength is still limited. In order to optimize the allocation of resources between urban and rural areas, the government should shift resources such as personnel, financial resources and material resources from regional advantageous schools to disadvantaged schools, and shift the policy of giving priority to urban development to rural areas and vulnerable groups, so as to further narrow the gap between urban and rural areas and promote educational equity. This not only allows rural teachers to enjoy the similar teaching infrastructure for urban teachers, but also makes the teachers in rural education feel that they are valued, so as to improve the professional identity of rural teachers and find their own value in rural education, so as to achieve the goal of rural teachers' team construction. On the other hand, China is a country with unbalanced regional development, and the network infrastructure construction between the east and the west is quite different. Therefore, it is necessary to optimize the allocation of resources in the eastern and western regions, and gradually narrow or even eliminate the gap in resource allocation between regions, so as to promote educational equity among regions. In particular, we should increase the allocation of resources in backward areas. The more backward areas are, the more attention should be paid to the allocation of resources, so that teachers in all regions can enjoy the same allocation of resources. This kind of education also requires speeding up the education informatization of backward areas, especially rural schools, to turn all regions and schools into a network, solve the problem of resource allocation, and finally cross the digital divide between regions and regions, between cities and villages.

### **Promote the Two-Way Flow of Urban and Rural Teachers and Realize the Integration of Urban and Rural Teachers**

Due to the scarcity of rural teachers and the serious loss of rural teachers and the difficulty of supplement, it can promote the two-way flow of rural teachers in the era of artificial intelligence, and truly realize the integration of urban and rural teachers. In the practice of teacher exchange between urban and rural areas mentioned above, it is often emphasized that it is a one-way flow from city to rural school. At the same time, in this one-way flow of teachers, most urban teachers do not flow to rural schools out of their own real will because of the big gap between rural conditions and urban conditions, traffic congestion, and far away from home. One way flow cannot solve the problem of shortage of rural teachers and is not conducive to the construction of rural teachers. Therefore, it is necessary to promote the construction of rural teachers. The one-way flow will be changed into the two-way flow between urban and rural schools, so as to realize the integration of urban and rural teachers. In this era of artificial intelligence, modern information technology has become a bridge between urban and rural teachers, playing an important intermediary role. On the one hand, in urban-rural communication, rural teachers are often ignored to go to urban schools for exchange and learning.

Therefore, rural teachers can be allowed to visit schools in counties, cities, and even provinces for exchange and learning. Modern information technology can be used to establish a provincial communication platform, with the school as the unit to establish personal information and data files for each teacher. At the same time, all schools in the province can make use of this platform to reserve schools for exchange. After a short-term exchange between teachers, the two schools will evaluate their performance and give them recognition. In this way, after each communication, teachers should also reflect, and the school will give evaluation and feedback. Increasing the learning opportunities of rural teachers can not only increase their sense of identity, but also promote the construction of rural teachers' team. It is more convenient for systematic management to use information technology. On the other hand, the flow form of teachers can no longer be confined to the offline flow, and the mobile teachers can choose the form of flow voluntarily, that is, they can choose either online or offline mobility or a combination of the two. In this way, the negative treatment of urban teachers can be avoided and the life of mobile teachers will not be disturbed. The specific implementation steps of offline communication are as follows: after choosing the form of mobility, migrant teachers should first go into the mobile schools and have a comprehensive and in-depth understanding of it in a short period of time. This step cannot be ignored, because both online and offline communication needs to be based on a comprehensive understanding of the school, and then converted to online form. Modern information technology has broken through the time and space constraints, so that urban and rural teachers can use the Internet for "supplementary exchange", promote the two-way flow of urban and rural teachers, achieve cross regional cooperation, urban and rural integration and share educational achievements, so as to promote education equity.

### **The University Cooperation Linkage Optimizes the Discipline Structure**

As mentioned above, rural teachers tend to be "multi disciplinary" and lack of teachers in music, art, sports, and other disciplines in rural schools is particularly serious. Because of their heavy teaching tasks, the school does not pay attention to these subjects and lack of professional knowledge in these concurrent disciplines, most teachers only regard it as a task, and cannot guarantee the final teaching effect and teaching quality. In this way, the overall development of rural school children in moral, intellectual, physical, aesthetic, and labor will be restricted to a certain extent, which will eventually lead to unfair education. In today's era of artificial intelligence, information technology can be used to solve this problem. The government should formulate relevant policies to encourage one-to-one cooperation between colleges and rural schools. These institutions of higher learning are not necessarily normal universities, but also support students of related majors to join them. At the same time, such cooperation is not limited to the region, but can be carried out across regional cooperation. This will broaden the scope and meet the needs of more rural schools. Every semester, students of music, art, sports, and other related majors are recruited in these colleges and universities. After selection, they are paired with rural schools one by one. At the same time, this kind of matching is not a groundless match, but a match based on the needs of some subject teachers who are short of in rural schools under big data. The one semester teachers selected by colleges and universities teach students music, art, sports, and other disciplines through online network platform. For rural teachers, it can reduce the pressure of teaching and focus on their own teaching to improve the quality of teaching; for students, they can accept the teaching of relatively professional and young teachers, stimulate students' interest in learning, and help students develop morally, intellectually, physically, aesthetically, and laboriously; for college students, they can improve their professional level and transform theoretical knowledge into practical knowledge In order to encourage students

to participate in it, colleges and universities should give some honorary awards to the selected students. Using modern information technology to link colleges and rural schools can not only solve the problem of unreasonable subject structure of rural teachers, but also has a positive impact on rural teachers, students of rural schools and college students.

### **Improve the Training Mechanism of Rural Teachers, Promote the Professional Quality of Rural Teachers**

Compared with urban teachers, rural teachers need more training because of their limitations in education and ability. Teacher training plays an important role in promoting teachers' personal professional development, improving the overall level of the school and the quality of education (Wu, 2015). There is a certain gap between rural teachers' professional quality and urban teachers' professional quality. Although the state has launched the "National Training Plan" to strengthen the construction of rural teachers' team through teacher training, and distance training is also used, there are still many problems. It is very important to improve the professional development of rural teachers in order to promote rural education. Therefore, we should make full use of the network information technology platform to establish cross regional and cross school teacher training, and there should be one-to-one targeted teacher training. What we mean here is not a famous educator training a rural teacher, but training between schools. First of all, based on the network information technology, it can be completely free from regional restrictions. For example, a school in the eastern region can be matched with a rural school in the western region. On the one hand, the matching between schools is convenient for both sides to train and communicate with each other. On the other hand, it is different from the previous practice of gathering teachers from all over the country to listen to some lectures or watch famous educators talk on the Internet and some universal educational theories. This kind of training form is a new type of education mode which uses the Internet, artificial intelligence, and other modern information technology to carry out teaching and learning interaction, which is conducive to the construction of a network, digital, personalized, lifelong education system, and learning society. Some researchers have pointed out that in teacher training, trainers often do not pay attention to the status of primary and secondary education for a long time, so the training content lacks continuity and systematicness. After the short-term training, the relationship between the trainers and the trainees is separated, and the teacher training becomes an isolated event, rather than a continuous process of gradual improvement, thus affecting the effectiveness of the training (Zhang & Wang, 2012). Through the modern information technology as a bridge, the training exchange based on the two schools is more targeted, and the teachers of the training side can carry out targeted training with the trained rural teachers based on the specific situation of rural schools. At the same time, it can set up a special team of teacher trainers to facilitate the two schools to establish a long-term and continuous cooperative relationship. This form not only breaks the limitation of time and space, but also ensures the quality of training, so as to promote the development of rural teachers' professional quality. The use of modern information technology can improve the evaluation and management mechanism of teacher training effect, and the trainers and trainees use the network platform to conduct two-way evaluation and implement the process evaluation.

### **Conclusion**

To sum up, the modern information technology in the era of artificial intelligence is closely linked with the construction of rural teachers, the development of rural education, the narrowing of the gap between urban and



rural education, and educational equity. Therefore, we should give full play to the advantages brought by the era of artificial intelligence to build rural teams, so as to avoid the problem of unfair education and maximize its effect on educational equity. We should realize educational equity.

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