

# The Overall Solution of Education under the Statistical Measure of Unbalanced and Inadequate Development of Basic Education

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**Abstract:** With the transformation of China's economic structure and upgrading of industrial structure, basic education plays an important role. On May 21, 2021, China deliberated and adopted the Opinions on Further reducing the Burden of Homework and Off-campus Training for Students in Compulsory Education. On July 24, 2021, the Guidelines on Further Reducing the Burden of Homework and Off-campus Training for Students in Compulsory Education were issued, hereinafter referred to as "double reduction". This paper will be in the double reduction policy, revitalization of local basic education and other documents. On the basis of the previous research on the development of basic education, this paper constructs a statistical measure problem between the evaluation of the sufficient situation of the development level of basic education and the gap of regional imbalance. In addition, the method of comprehensive questionnaire was selected to design endogenous factors and exogenous factors. With the method of factor analysis, this paper explores how to promote the coordinated development of regional education ecology under the new pattern of education development implemented by double reduction policy. The conclusion of the study is that "fair and quality education" is an important part of people's yearning for a better life. With the improvement of per capita education level, it is a top priority to receive fair and quality basic education. The state has effectively improved the scale and fair full development of basic education in backward areas through policies and public funds. The imbalance of basic education equity and basic education quality is heterogeneous. It is necessary to improve the overall learning resource environment of schools by using Internet technology, build a better educational ecosystem, remove the "digital divide" and break through the "digital dividend".

**Keywords:** Basic education, Educational Equity, Statistical Models, Digital Dividends.

## 1. Introduction

With the transformation of China's economic structure and upgrading of industrial structure, basic education plays an increasingly important role. On July 24, 2021, the General Offices of the CPC Central Committee and The State Council issued opinions on Further reducing the Burden of Homework and off-campus training for Students in Compulsory Education. All localities and departments are required to earnestly implement these measures in light of actual conditions. In August of the same year, the Office of the Education Supervision Committee of The State Council issued a special notice to inform provinces of the implementation progress of the "double reduction" work every two months, presented a series of pain points in the education industry. At the same time, by the end of June 2021,

the monthly active users of Mobile Internet in China have reached 1.155 billion, and the scale of mobile intelligent terminals has exceeded 1.37 billion. Wechat has more than 963 million monthly active users. The Internet has deeply affected every aspect of people's life. It is an inevitable choice of The Times and history to use the Internet thinking to help solve the problem of multi-party management of education.

In the course of continuous reform and improvement of education. If we regard education as an ecology: school, family and society are all important factors affecting the growth of children. Education should link the educational forces of colleges and universities, primary and secondary schools, families and society to systematically shape a good educational atmosphere. School, family and society are important components of children's growth. Therefore, we can divide the main body of education into the following six directions, as shown in Figure 1.

Figure 1



Figure 1. The main body of education

Based on this, scholars at home and abroad (based on the nationality of the author, all Chinese will be replaced by China). Different methods are used to analyze and study the role of basic education in national life. At present, most scholars analyze the development of the education industry in a decentralized way, or only consider the basic education mode planned by the government, or only focus on and build a platform to realize the market allocation mode of accurate education. This group tries to combine the two organically and make full use of the positive role of taxation and finance to provide a new growth point for the development of education. Group will adopt the method of static, qualitative analysis, enriched the theory basis for the development of basic education and Internet, the project will be on the basis of the research at home and abroad, according to the new situation of China's education environment, the selection of appropriate statistical model to build evaluation system of the level of the education industry development present situation, and the case of multiple factors effects the education industry development trend analysis, Therefore, it has certain academic value.

## **2. Statistical Model of Unbalanced and Inadequate Development of Basic Education**

Williamson (1965) was an early international scholar who made empirical analysis on regional inequality within a country. He made comprehensive use of cross section and time series data. In addition, the population-weighted coefficient of variation is constructed to measure the degree of relative differences between regions, and this method has become an important method for relevant researches later. D. Hu(2008) divides education services into: basic education products belong to pure public goods, and higher education products belong to quasi-public goods. This paper argues that the government should provide basic education with all its strength and fulfill the responsibility that the market cannot bear or cannot bear, so as to correct the market failure. We recognize that the government plays a leading role in the overall planning and resource allocation of the education sector. R. Male (2016) also pointed out that the government should take the initiative to undertake the relevant obligations to promote education fair, to develop a security education fair law and policy, take concrete including change education resources into established pattern, the reform of basic education evaluation pattern for vulnerable groups such as education, and is committed to the social value of fairness and justice system, So as to make education more equitable. Therefore, we can see from the education industry, the government must give full play to its leading position, rational allocation of resources is extremely important. As for

how to allocate resources reasonably according to national conditions. S.M. Wang(1997) expressed his opinion early on that education should not be excessively marketized. First, education is a non-productive and non-economic sector. Second, education is a non-profit public sector that provides public or quasi-public goods rather than private goods. It does not have or does not have the basic condition of marketization completely. The market allocation of resources in the economic field can not be simply transplanted to education, the implementation of education marketization, completely regulated by the market education, what's more, the market economy has its inherent defects, market regulation also has failures and mistakes. And now the state vigorously integrated capitalized education, the implementation of double reduction policy. Q.H. Cai (2009) discussed how to improve the government's educational supervision ability to promote educational equity. By drawing lessons from the policies of some foreign governments to solve the problem of educational equity. 1. Government-led strategies and actions at the national government level play a leading role in realizing the development of educational equity 2. School reform "Schools themselves are the core of promoting educational equity". L.Y. Xu (2007) The development, utilization, allocation and management of educational resources are all indispensable links for educational activities. Scientific development, reasonable allocation, effective utilization and orderly management of educational resources are the fundamental guarantee for the smooth achievement of educational goals and the full play of educational functions. They interact and restrict each other. The purpose of developing, allocating and managing educational resources is to make effective use of educational resources.

Based on previous ideas, we selected the statistical index layer and adopted the THREE-DIMENSIONAL index design method to construct the evaluation index system Table 1.

The data sources of the original indicators in this paper are as follows: first, the website of the National Bureau of Statistics, including the student-teacher ratio, the number of full-time teachers, GDP and other indicators; The second is "China Education Statistics Yearbook" and "China Education Expenditure Statistics Yearbook", "China Education Statistics Yearbook" data mainly by the number of enrollment and number of students and other indicators, "China Education Expenditure Statistics Yearbook" data mainly for education funds and public financial budget education funds. In addition, as some indicators on the website of the Bureau of Statistics started from 2008, we will supplement the data from 2005 to 2007 through the Chinese Social Statistics Yearbook. Due to the existence of inflation factor, in order to strengthen the comparability between the indicators with currency as the component unit, the GDP deflator is used for processing.

**Table 1.** The evaluation index system

The project layer	The original target	The data source
Education scale	1. Proportion of Government expenditure on education in GDP (%)	Education Funds statistics, China Statistical Yearbook
	2. Average number of students in basic education (primary and junior high schools) per 100,000 population	Chinese Educational Statistical Yearbook, Chinese Social statistical Yearbook (2005-2007 data)
	The proportion of education expenditure in GDP of regular basic education schools (primary and junior middle schools)	China Education Expenditure Statistical Yearbook, website of National Bureau of Statistics
	4. Proportion of education expenditure (basic education schools) in GDP of public finance budget	China Education Expenditure Statistical Yearbook, website of National Bureau of Statistics
	5. Average years of schooling for the population	National Bureau of Statistics demographic data, education statistics
	Standardized school coverage for compulsory education	Education statistics
Education fair	Teacher/Student Ratio [General Basic Education schools (primary and junior high schools)]	Website of National Bureau of Statistics
	8. Books per Student [General Basic Education school (primary school, junior high school)]	Education statistics
	9. Number of teaching terminals per 100 students [General basic education schools (primary and secondary schools)]	Education statistics
	10. Education Expenses per student in general public budget [Basic education school (primary school, junior high school)]	China Education Expenditure Statistical Yearbook
	Public funds of general public budget per student [General basic education school (primary school, junior high school)]	China Education Expenditure Statistical Yearbook
	Index of Education Expenditure per Student [General Basic Education Schools (primary and secondary schools)]	China Education Expenditure Statistical Yearbook
	Proportion of primary school enrolments who have received pre-school education	

### 3. Statistical Models

#### 3.1. Statistical Measure of Imbalance

Firstly, the parameters reflecting the level of basic education are constructed according to the existing index system.  $edu_{ijt}$  Next, standardize the parameters.

$$edu_{ijt}' = \begin{cases} \frac{0}{100} & edu_{ijt} < edu_{ijt}^{Q1} \\ \frac{edu_{ijt} - edu_{ijt}^{Q1}}{edu_{ijt}^{Q99} - edu_{ijt}^{Q1}} * 100 & edu_{ijt}^{Q1} \leq edu_{ijt} \leq edu_{ijt}^{Q99} \\ 100 & edu_{ijt} > edu_{ijt}^{Q99} \end{cases} \quad (1)$$

Where, represents the index value of the JTH index in the TH year in the ITH region, and is the standardized original index value. The larger the value is, the more fully the basic education dimension represented by this index is developed.  $edu_{ijt}^{Q1}$  Is 1% of the quantile of the original index value, is 99% of the quantile of the original index value. The purpose of this processing is to eliminate the influence of extreme values on standardization, and at the same time to show that there is a limit to full development, as long as it reaches a certain level, it can be considered as full development.  $edu_{ijt}^{Q99}$  Since all the original indicators are positive indicators, there is no need to reverse the indicators.

In the second step, since the underdevelopment index is calculated in this paper, it is necessary to reverse the standardized value, and the formula is shown in Equation (2) :

$$edu_{ijt}'' = 100 - edu_{ijt}' \quad (2)$$

The third step is to assign weights to the project layer and the original index (two levels). Considering that the weight obtained by coefficient of variation method and principal component analysis method is far from the reality, this paper mainly carries out weight assignment at item level based on entropy weight method. Among them, the weight of basic education scale and fairness of basic education at the project level will be obtained by entropy weight method:

The fourth step is to calculate the sub-index and total index of underdevelopment of basic education.

$$esd_{it} = \sum_{j=1}^4 edu_{ijt}'' * \omega_j \quad (3)$$

$$eed_{it} = \sum_{j=5}^{11} edu_{ijt}' * \omega_j$$

$$ed_{it} = esd_{it} * \omega_{es} + eed_{it} * \omega_{ee} + eqd_{it} * \omega_{eq}$$

#### 3.2. Measurement of regional educational development imbalance -- Kernel density measurement

Kernel density estimation is a method in probability theory to study data distribution characteristics (skewness and peakness) starting from the data sample itself. It was proposed by Rosenblatt (1955) and Parzen (1962). The application of this method in the measurement of regional economic development imbalance is through the corresponding estimation process. The distribution characteristics of index

data in each region are displayed through the density distribution map. If the density distribution maps of multiple years are superimposed, the changes of the distribution characteristics of index data over time can be analyzed. Before kernel density estimation, it is necessary to specify the kernel function and calculate the corresponding optimal bandwidth. Referring to A. Yan (2020), this paper adopts gaussian normal distribution as the kernel function, represented by  $K(x)$ , and the density at each point  $x$  is:

$$f(x) = (1/nh) \sum k((x_i - \bar{x})/h) \quad (h = 0.9An^{-1/5}) \quad (4)$$

Where,  $X_i$  is the log value of the JTH indicator in the year  $T$  in the ITH region,  $\bar{X}$  is the average value of the JTH indicator in the year  $T$  in the ITH region,  $N$  is the number of regions, and  $H$  is the window width.

### 3.3. The Measurement of Absolute Imbalance in Regional Educational Development -- Wilson Coefficient

The measurement methods of imbalance include Williamson coefficient, Gini coefficient, Theil index and so on. The formula of Williamson coefficient is as follows:

$$V_w = \frac{1}{\bar{y}} \sqrt{\sum_{i=1}^n (y_i - \bar{y})^2 \frac{P_i}{P}} \quad (5)$$

$\bar{y}$  is the mean value of this attribute value,  $n$  is the number of regions,  $y_i$  is the population of the ITH region,  $P$  is the total population, which is in essence based on the weight of population. Drawing on Williamson's practice, this paper constructs the following exponential method to measure the imbalance in the development of basic education:

$$V_w - edu_{jt} = \frac{1}{\overline{edu_{jt}}} \sqrt{\sum_{i=1}^n (edu_{ijt} - \overline{edu_{jt}})^2 \frac{P_i}{P_t}} \quad (6)$$

$V_w - edu_{jt}$  Said the first in the first  $j$   $t$  reflect an imbalance in basic education development indicators, for  $t$  in the case of a province or territory of the first  $j$  I reflect the situation of basic education development indicators, as in the first  $j$   $t$  index of average,  $n$  represents the number of provinces and regions, for  $t$  in the case of a province or territory I average number of students in basic education schools,  $P_t$  is the total number of students in general basic education schools in China in  $t$ .  $\overline{edu_{ijt}}$   $\overline{edu_{jt}}$   $P_i$   $P_t$   $V_w - edu_{jt}$  The larger the  $j$  index is, the more serious the imbalance of the development of basic education is.

### 3.4. Measurement of Relative Imbalance in Regional Educational Development -- Weighted Coefficient of Population Variation

It is assumed that the research area is divided into  $M$  regions, each region is represented as, each region contains  $N$  regions, and the region within the region is represented as, then the research area contains a total of regions, and the formula is as follows:  $d_i d_{ij} \sum_{i=1}^m \sum_{j=1}^n d_{ij}$

$$CV(Y)^2 = \frac{1}{\bar{y}^2} \sum_{i=1}^m \sum_{j=1}^n \frac{P_{ij}}{P} (y_{ij} - \bar{y})^2 \quad (7)$$

Type,  $Y = (Y_1, Y_2, \dots, Y_m)$ , and  $Y_i = (y_{i1}, y_{i2}, \dots, y_{in})$

Represents a hierarchy.  $P_{it}$  is the number of students in general basic education schools in the ITH province or region in  $t$ , and  $P_t$  is the total number of students in general basic education schools in China in  $T$ .  $P_t$  Table Y studies the development level of basic education in the region.

## 4. Analysis of the Situation of Inadequate Development of Education

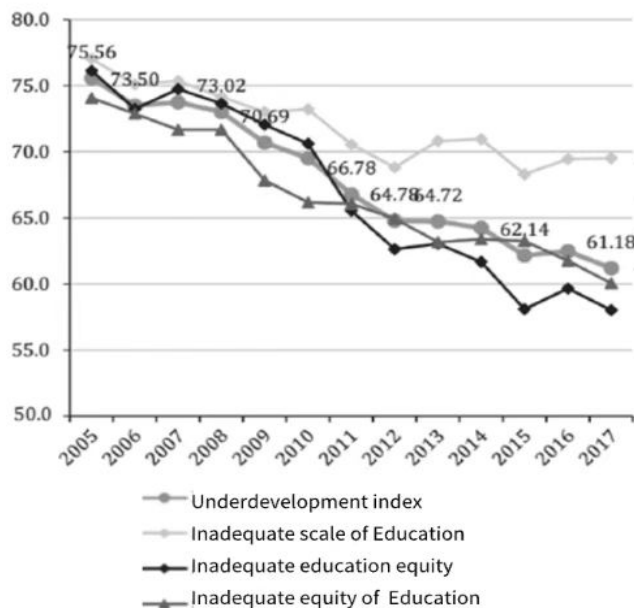


Figure 2. The measure result

The results show that the underdevelopment of basic education in China from 2005 to 2017 has the following aspects: First, the inadequacy of educational development shows an obvious downward trend but the degree is limited, among which educational equity makes the greatest contribution to promoting the full development of basic education. In 2005, the comprehensive index of underdevelopment of basic education was 76.2, but it dropped to 61.9 in 2017, with the inadequacy dropping by 18.75 percent and the average annual decline of 1.71 percent. In 2011, the decline rate of inadequacy of basic education was 5.3%, followed by that of 2015, which was 4.2%. Among them, paying more attention to the fairness of basic education is the most important factor for the decline of the inadequate development of basic education. From 2005 to 2017, the inadequate index of basic education decreased by 24.86%, which directly led to the decline of 9.95% of the comprehensive index of the inadequate development of basic education, contributing to more than 52%. 2009 and 2017 are two major years for the improvement of equity in basic education. The improvement of the quality of basic education is also very obvious. The inadequate index of basic education quality in 2017 decreased by 20.98% compared with 2005, which directly reduced the comprehensive index of inadequate development of basic education by 8.25% and contributed 44% to the comprehensive index of inadequate development of basic education. There is relatively little room for improvement in the scale of basic education. The scale of basic education inadequacy index in 2017 decreased by 10.40% compared with 2005. In addition, from the perspective of time, since 2012, the decline trend of inadequate development of basic education has slowed down and increased volatility.

Second, the imbalance of regional development is still the main reason for the inadequate development of basic education. The inadequate development of basic education can be divided into the insufficient development in time dimension and the insufficient development in space dimension. The insufficient development in space dimension is the insufficient development caused by regional imbalance. Although the comprehensive index of the inadequate development of basic education decreased by 18.75% from 2005 to 2017, However, the comprehensive index of underdevelopment in 2017 still reached 61.9, and the level of underdevelopment caused by regional imbalance accounted for more than 80%. In order to improve the problem of underdevelopment of basic education, the gap between regions must be narrowed from the perspectives of basic education input, enrollment of basic education and quality of basic education. In order to improve the regional imbalance in basic education, the Chinese government implemented the "Cooperation Plan for Supporting Enrollment in western China" in 2008 to expand the enrollment scale of high-quality colleges and universities in the eastern region from the backward areas in western China. In 2012, the "Revitalization Plan of Basic Education in central and Western China" was implemented to improve the level of basic education in central and Western China through financial support and narrow the gap with eastern China. According to the measurement results, policies to improve regional imbalance in basic education still need to be strengthened.

Third, with the passage of time, the structural heterogeneity of the inadequate development of basic education increases, and the emphasis on the fairness and quality of basic

education may lead to the relatively lagging development of basic education scale. In 2005, the gap between the scale of basic education, the fairness of basic education and the quality of basic education was small, with the inequality index of basic education being 77.28 and the quality of basic education being 74.74, with a difference of only about 2.5. However, the improvement of the scale of basic education is relatively small, while the fairness of basic education has been greatly improved, which has intensified the structural heterogeneity of the inadequate development of basic education. In 2017, the inadequacy index of the scale of basic education was 68.69, while the inadequacy index of the level of basic education was 58.07, with a difference of more than 10.6. The increase of investment in basic education does not match the level of economic development. The proportion of expenditure on basic education in GDP of Beijing, Shanghai and other regions shows that.

In Beijing, for example, the proportion of education expenditure in GDP of regular institutions of higher learning decreased from 2.64% in 2005 to 1.38% in 2017. Therefore, while striving to achieve the goal of "fair and quality basic education", it is necessary to increase the investment in basic education and further improve the universality of basic education.

## 5. Factor Analysis of Questionnaire System

We use the empirical method to verify the model of influencing factors of education, and the empirical method uses the electronic version. The design of the questionnaire largely determines the validity and accuracy of the statistical results. In terms of questionnaire design, the first draft of the questionnaire was drafted on the basis of questions related to the selection of the Statistical index system of China's Education Monitoring and Evaluation proposed by the Ministry of Education in December 2020. Secondly, the comprehensibility and completeness of the questionnaire were continuously improved according to the feedback during the survey.

The questionnaire is divided into two parts. The first part is the objective factors of students, teachers and schools, such as teachers' and students' educational background, school development level and the region where they belong. The second part is the subjective part of the influencing factors in the education industry. First of all, the degree of influence of each factor affecting education is evaluated and scored respectively. The evaluation of the influencing factors is based on the survey results, and the principal component analysis method is used to analyze and summarize the main influencing factors. This paper summarizes the main influencing factors of education into five factor variables.

### 5.1. The Questionnaire Design

### 5.2. Data Processing and Statistical Analysis

#### 5.2.1. Reliability Test

The reliability test of the questionnaire is also the reliability test of the questionnaire. It refers to the consistency of the results obtained by repeated measurement of the same object with the same method, that is, the degree of reflecting the actual situation. Reliability itself has nothing to do with the accuracy of the measurement results, its function is to test

whether the measurement itself is stable, the higher the reliability of the test, the more reliable the test results. The commonly used reliability test methods include Alpha, Retest Method, ante-Forms Method, Split Half Method and Cronbach  $\alpha$  coefficient Method. They reflect the reliability

test from different angles. This questionnaire adopts the Kronbach method to test according to the data characteristics. We conducted a three-dimensional reliability analysis of the questionnaire and concluded that:

**Table 2.** The questionnaire design

The primary variable	The secondary variables	Level 3 variables	item
External factors	H1 Regional development level	Urban development level	2
	H2 School development level	faculty	3
		Money into	4
		Hardware facilities	7
		Quality education	8
Internal factors	H5 Establish teaching objectives	The degree of clarity of teaching objectives	9 - (1)
		The attainment of course progress	9 - (2)
		Reasonable degree of teaching objectives	9 - (3)
	H6 Teaching process framework design	Course and problem set	10 - (1)
		Degree of integration between curriculum and practice	10 - (2)
		Diversification of teaching tools	10 - (3)
	H7 teaching effect evaluation	Degree of knowledge mastery after class	11 - (1)
		Degree of improvement in thinking ability	11 - (2)
		The degree to which ideas are shaped	11 - (3)

①Reliability analysis of school development level

**Table 3.** Reliability statistics

Reliability statistics		
Clone Bach Alpha	Standardized term based clone Bach Alpha	A number of
843.	843.	2

The clone Bach number is close to 1, and the data has good reliability. It shows that the development level of schools is the key factor affecting the development of education. In the face of the needs of quality education development in the new era, whether schools can effectively improve the level of teaching services, promote the process of digital teaching, improve the satisfaction of students' parents and so on all affect the development of quality education.

②Reliability analysis of students' subjective factors

**Table 4.** Reliability statistics

Reliability statistics		
Clone Bach Alpha	Standardized term based clone Bach Alpha	A number of
860.	846.	20

The clone Bach number is close to 1, and the data has good reliability. It shows that the subjective factor of students is an important factor affecting the development of education. Students' ability to master learning independently and their acceptance of class also become one of the factors affecting the development of education.

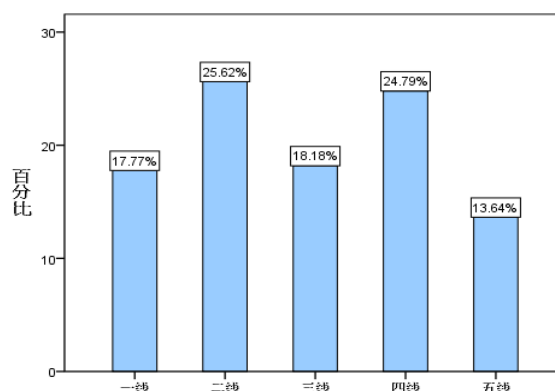
③Reliability analysis of school satisfaction

**Table 5.** Reliability statistics

Reliability statistics		
Clone Bach Alpha	Standardized term based clone Bach Alpha	A number of
945.	946.	5

The clone Bach number is close to 1, and the data has good reliability. It shows that the factors of school satisfaction are also important factors affecting the development of education. This includes the satisfaction of parents and students to the school.

**5.2.2. Validation Test**



**Figure 3.** Validation test

In the questionnaire survey, 17.77% of students came from first-tier cities, and most of them came from second-tier and fourth-tier cities, accounting for 25.62% and 24.79%, respectively. Elementary school students accounted for 22.73 percent, middle school students 32.23 percent, and high school students accounted for 45.04 percent.

### 5.3. Analysis of Questionnaire

By investigating the degree of students' satisfaction with school infrastructure, we find that students in first-tier cities and second-tier cities are generally satisfied with school infrastructure, with more than 95% of students choosing to be satisfied or very satisfied, while those in fifth-tier cities are not satisfied with school infrastructure. It can be seen that the more developed the area, the better the facilities, the higher

the satisfaction.

In the survey of the satisfaction of teaching equipment and life infrastructure, the satisfaction of students in first-tier and second-tier cities is still very high, both as high as over 80%, while the satisfaction of students in third-tier and lower-tier cities is low, which shows that the level of regional development has a great impact on the configuration of education infrastructure.

**Table 6. Questionnaire**

您对学校教学设备（多媒体、智能化教学设备）配备满意程度

	您所在的城市是几线城市					总计
	一线	二线	三线	四线	五线	
很满意	33 76.7%	36 58.1%	12 27.3%	4 6.7%	2 6.1%	87 36.0%
满意	8 18.6%	17 27.4%	10 22.7%	3 5.0%	6 18.2%	44 18.2%
一般	1 2.3%	8 12.9%	15 34.1%	17 28.3%	6 18.2%	47 19.4%
不满意	1 2.3%	0 0.0%	7 15.9%	23 38.3%	7 21.2%	38 15.7%
完全不满意	0 0.0%	1 1.6%	0 0.0%	13 21.7%	12 36.4%	26 10.7%
总计	43 100.0%	62 100.0%	44 100.0%	60 100.0%	33 100.0%	242 100.0%

您对学校素质课程设计（艺术人文类课程、体育类课程、科创类课程）的满意程度

	2.您所在的城市是几线城市？					总计
	一线	二线	三线	四线	五线	
很满意	29 67.4%	27 43.5%	10 22.7%	3 5.0%	1 3.0%	70 28.9%
满意	12 27.9%	27 43.5%	14 31.8%	9 15.0%	7 21.2%	69 28.5%
一般	1 2.3%	3 4.8%	10 22.7%	18 30.0%	7 21.2%	39 16.1%
不满意	1 2.3%	4 6.5%	9 20.5%	20 33.3%	10 30.3%	44 18.2%
完全不满意	0 0.0%	1 1.6%	1 2.3%	10 16.7%	8 24.2%	20 8.3%
总计	43 100.0%	62 100.0%	44 100.0%	60 100.0%	33 100.0%	242 100.0%

您对学校生活类基础设施（食堂、宿舍）配备满意程度

	2.您所在的城市是几线城市？					总计
	一线	二线	三线	四线	五线	
很满意	26 60.5%	23 37.1%	16 36.4%	4 6.7%	4 12.1%	73 30.2%
满意	14 32.6%	32 51.6%	6 13.6%	9 15.0%	6 18.2%	67 27.7%
一般	3 7.0%	6 9.7%	14 31.8%	10 16.7%	5 15.2%	38 15.7%
不满意	0 0.0%	1 1.6%	7 15.9%	17 28.3%	6 18.2%	31 12.8%
完全不满意	0 0.0%	0 0.0%	1 2.3%	20 33.3%	12 36.4%	33 13.6%
总计	43 100.0%	62 100.0%	44 100.0%	60 100.0%	33 100.0%	242 100.0%

您对学校学生社团多元化的满意程度

	2.您所在的城市是几线城市？					总计
	一线	二线	三线	四线	五线	
很满意	25 58.1%	33 53.2%	13 29.5%	5 8.3%	4 12.1%	80 33.1%
满意	15 34.9%	19 30.6%	7 15.9%	6 10.0%	6 18.2%	53 21.9%
一般	2 4.7%	8 12.9%	12 27.3%	10 16.7%	3 9.1%	35 14.5%
不满意	1 2.3%	2 3.2%	10 22.7%	20 33.3%	9 27.3%	42 17.4%
完全不满意	0 0.0%	0 0.0%	2 4.5%	19 31.7%	11 33.3%	32 13.2%
总计	43 100.0%	62 100.0%	44 100.0%	60 100.0%	33 100.0%	242 100.0%

By investigating students for the school quality education, satisfaction with the degree of satisfaction is very high, a second-tier cities are not satisfied with only a few, in the four lines and five cities, most of the students on the installation of quality education are not satisfied, we can see education resources lead to unfair distribution in different parts of the satisfaction is low.

## 6. Conclusion

"Fair and quality education" is an important part of people's yearning for a better life. With the improvement of per capita education level, it is a top priority to receive fair and quality basic education. Therefore, on the basis of discussing the connotation of unbalanced and inadequate development of basic education, this paper constructs an evaluation index system of unbalanced and inadequate development of basic education from three dimensions of education scale, education equity and education quality, and collects provincial data from 2005 to 2017. The statistical measure of inadequate development and unbalanced development is carried out by using the standardized method and Williamson's coefficient method respectively. The main conclusions of this paper include:

First, the inadequacy and imbalance of the development of basic education showed an obvious downward trend, but the improvement of the imbalance was greater than the improvement of the insufficiency. The annual decline rate of the comprehensive index of the inadequate development was 1.71%, while the annual decline rate of the comprehensive index of the unbalanced development was 2.68%. The improvement of the insufficiency problem is mainly based on the improvement of the fairness of basic education, while the improvement of the imbalance problem is contributed by the regional balance of the scale of basic education.

Second, although regional imbalance has been greatly improved, regional imbalance is still the main reason for the inadequate development of basic education. The inadequate improvement of basic education development from 2005 to 2017 is only about 20% of the comprehensive index of inadequate development in 2017. This also shows that there is still a lot of room to improve the regional balance of basic education.

Third, with the passage of time, the structural heterogeneity of the inadequate development of basic education increases, and the emphasis on the fairness and quality of the full development of basic education leads to the relatively backward development of the scale of basic education and the relative insufficient investment in education funds. The imbalance of basic education resources occupied by some provinces and regions is also an important factor for the inadequate development of basic education scale.

Four is the foundation education quality education on the basis of the regional imbalance evolved development imbalance of the core issues, the quality of basic education in 2005-2017 regional balance has not been improved significantly, the development of "fair" and the basis of quality education, to improve the quality of basic education, promote basic education connotative development is becoming more urgent and important.

In addition, this paper also finds that the government has effectively improved the scale and fair full development of basic education in backward areas through policies and public

funds, while the adequate development of Henan and Shandong provinces needs to be greatly improved. The imbalance of basic education equity and basic education quality is heterogeneous. It is necessary to improve the overall learning resource environment of schools by using Internet technology, build a better educational ecosystem, remove the "digital divide" and break through the "digital dividend".

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## References

- [1] D. Hu: Research on the allocation of government resources and education equity in basic education and higher education (Southwestern University of Finance and Economics Press, China 2008).
- [2] J.R. Jin: Research on the Government's Responsibility to promote education equity (Nanjing Agricultural University Press, China 2016).
- [3] S.M. Wang: Educational Resources Allocation under the condition of socialist market economy, *Education and Economy*, Vol. 26 (1997) No.3, p.1-6.
- [4] Q.M. Cai: Research on The Strategy of Promoting Education Equity by Chinese Government (Jilin University Press, China 2009).
- [5] L.Y. Xu: Research on Educational Resource Allocation Theory (Northeast Normal University Press, China 2007).
- [6] F.X. Wang: A review of the "Education Industrialization" in China, *Journal of Northeast Normal University (Philosophy and Social Sciences edition)*, Vol.16 (2004) No.6, p.5-14.
- [7] S. Man: Analysis of property rights in compulsory education Resource Allocation, *Education and Economy*, Vol. 23 (2003) No.2, p.39-44.
- [8] X.Z. Fan: Educational Inefficiency and Educational Property Rights, *Journal of Central China Normal University (Humanities and Social Sciences Edition)*, Vol. 12 (2005) No.3, p.5-10.
- [9] X.Y. Li, B.Q. Liu: Research on intelligent classroom teaching mode based on constructivism, *China Education Informatization*, Vol. 26 (2018) No.6, p.44-48.
- [10] N. Wang, Z. Yang: Hybrid Teaching Mode design based on Cloud Classroom -- A Case study of Cloud Classroom of China Normal University, *China Electronic Education*, Vol. 31 (2005) No.4, p.85-89.
- [11] L.Y. Wan, Z.F. Huang, H. Huang: Big data-driven precision teaching: operational framework and implementation path, *Modern educational technology*, Vol. 29 (2019) No.1, p.31-37.
- [12] J.S. David: *Globalization and Postmodern Pedagogy* (Education Science Press, China 2000).
- [13] E.T. McGraw-jones: *The Impact of Financing on financial Growth*, Prentice-Hall, Vol. 31 (1983) No.7, p.349.
- [14] E. John, M. Terry: *Politics, Markets and Schools* (Education Science Press, China 2003).
- [15] W. Jeff, B. Sally, H. David: *Decentralization and school choice in Education: School, Government and market* (Education Science Press, China 2003).

- [16] Y. Liu, H.Y. GAO: The Experience of Educational Resource sharing in The United States and its Enlightenment --Hughes' Theoretical Perspective, Foreign Education Research, Vol. 31 (2005) No.7, p.69-72.
- [17] O.R. Lindsley: Precision teaching: Discoveries and effects, Journal of Applied Behavior Analysis, Vol. 15 (1992) No.1, p.51-57.
- [18] A.C. Downer: He National Literacy Strategy Sight Recognition Programme Implemented by Teaching Assistants, Educational psychology in practice, Vol. 23 (2007) No.2, p.129-143.
- [19] C.P. Griffin, L. Murtagh: Increasing the sight vocabulary and reading fluency of children requiring reading support: Educational Psychology in Practice, Vol. 31 (2014) No.2, p.186-209.
- [20] B. Strømgren, C. Berg-Mortensen, G. Tan: The application of precision teaching to teaching basic math facts, European Journal of Behavior Analysis, Vol. 15 (2014) No.2, p.225-240.