frontiers | Frontiers in Education

TYPE Original Research
PUBLISHED 14 March 2024
DOI 10.3389/feduc.2024.1296141

OPEN ACCESS

EDITED BY
Fatma Mabrouk,
Princess Nourah Bint Abdulrahman University, Saudi Arabia

REVIEWED BY
Masahina Sarabdeen,
Princess Nourah Bint Abdulrahman University, Saudi Arabia
Céline Bonnefond,
Université Grenoble Alpes, France

*CORRESPONDENCE
Xingyu Wang
✉ 18893711885@139.com

†These authors have contributed equally to this work and share first authorship

RECEIVED 02 October 2023
ACCEPTED 19 February 2024
PUBLISHED 14 March 2024

CITATION
Wang X and Ruan J (2024) Education helps to achieve shared prosperity: evidence from China.
Front. Educ. 9:1296141.
doi: 10.3389/feduc.2024.1296141

Education helps to achieve shared prosperity: evidence from China

Xingyu Wang[1,2*†] and Jing Ruan[2†]

[1]School of Statistics, Capital University of Economics and Business, Beijing, China, [2]School of Data Science, Capital University of Economics and Business, Beijing, China

The realisation of the common wealth of all people has become the theme of the new era, and how to promote the process of realising common wealth in a solid and effective manner has become an important issue that needs to be resolved urgently. Combined with the essential connotation of common wealth, it is believed that education plays an important role in improving the quality of nationals to promote the common wealth in a solid manner. Therefore, this paper focuses on the realisation path of education for common prosperity. In order to explore this issue, this paper has constructed the index of education development level and the coefficient of common wealth, which characterise the independent variable and the dependent variable respectively. At the same time, it empirically analyses the mechanism of education development level on common prosperity by using two-way fixed effect model. It is found that, firstly, from 2012 to 2020, the coefficient of common wealth in China shows an increasing trend, and it is higher in the eastern region than in other regions, and lowest in the western region; secondly, educational inequality hinders common wealth to a certain extent; thirdly, the average years of education of China's current employed population is low, which may have a negative impact on the common wealth; and fourthly, improving the level of education can significantly contribute to the realisation of common wealth.

KEYWORDS

equity in education, shared prosperity, quality development, average years of schooling, level of educational development

1 Introduction

Common wealth is a standard of living in which all people, through hard work and mutual assistance, eventually reach a level of abundance of food and clothing, that is to say, universal wealth on the basis of the elimination of polarization and poverty (Zhang and Li, 2021; Lin, 2022; Zhang, 2022). It is one of the important elements of Deng Xiaoping's theory of building socialism with Chinese characteristics (Deng Xiaoping Theory). As China is a vast country with a large population, common prosperity is not about getting rich at the same time, but about part of the population and part of the region getting rich first, and the first to get rich helping the second to get rich, to gradually realize common prosperity. Common prosperity is the essential provision and goal of socialism and the fundamental principle of Chinese socialism.

The realization of common wealth is the essential requirement of socialism and the common aspiration of all Chinese children since the new era. Since the CPC Central

Committee put forward the process of realizing "common prosperity," a large amount of literature has emerged in the academic world. At first, most of the literature is based on the value judgment and connotation of common prosperity, and mostly discusses the basic meaning of common prosperity, the path of realization, and the details of control that should be paid attention to in the process of realizing common prosperity. Combined with the spirit of the documents of the Party Central Committee, the academic community has now reached a consensus on the basic meaning of common wealth. Afterwards, the process of measuring the realization of common wealth and its stage-by-stage evaluation have become the focus of literature research. At the same time, there are also more literature in the common wealth perspective to carry out research, more or less involved in the common wealth-related topics. It is clear that "common wealth" is not only a grand proposition that the Party Central Committee and the government attach great importance to in the new era, but also an important research proposition that is widely concerned by all sectors of the society and is practically related to people's interests. Although there are studies on the path of realizing common wealth in the existing literature, there are few of them from the perspective of education.

In order to promote the realization of the common wealth of all people, it is necessary to find the starting point of promoting the realization of the common wealth, and education, as a century-long plan to establish morality and cultivate people, plays an important role in improving the quality of the whole people, enriching the people's spiritual world, improving the people's standard of living, and creating material wealth (Wan et al., 2022). Therefore, this paper focuses on the study of the realization mechanism of education for the common wealth, and tries to answer two major questions: firstly, whether education can contribute to the realization of the common wealth; and secondly, how education can contribute to the realization of the common wealth.

In order to answer the above questions, firstly, we need to clarify how to quantify the degree of common prosperity and how to quantify the level of education development, in order to solve this problem, this paper firstly measured the weighted coefficients of Gini coefficient and Engel coefficient of each province and city in order to characterize the degree of common prosperity, and the degree of common prosperity is the explanatory variable of this paper, and then we constructed the index of the level of education development which is the core explanatory variable of the level of education. Secondly, the index of education development level is constructed, and education development level is the core explanatory variable. On this basis, labor force level, economic development level, people's livelihood development level and innovation development level are introduced as the control variables in this paper, and the fixed effect model is used to explore the impact of education on the common wealth, in order to answer the question of whether education can promote the realization of the common wealth. Obviously, education plays a positive role in the fields of economic growth, social harmony, political stability, people's happiness and ecological security, and the findings of the empirical analyses provide a basis of judgment for this assertion. Therefore, this paper puts forward the conclusion that education can effectively contribute to the realization of common wealth.

In addition, in the process of exploring the mechanism of education for the realization of common wealth, this paper does not detach itself from the key point of "education equity," that is, education equity is also the most effective means to promote the realization of common wealth. In view of this, this paper uses the data from the China Labor Statistics Yearbook to calculate the average years of schooling and the Gini coefficient of education from 2012 to 2020, and finds that the average years of schooling in China's provinces are uneven, and the Gini coefficient of education is decreasing year by year, i.e., the degree of inequality in education has been gradually weakened, and the equalization of education is being effectively promoted.

The remainder of the article is structured as follows: section 2 is the literature review, section 3 is the index construction and measurement, section 4 is the research hypothesis and analytical framework, section 5 is the research design and data description, section 6 is the empirical analysis, and lastly, the conclusions and implications.

2 Literature review

In the context of the strategy of realizing common wealth in the new era, the study of the relationship between education and common wealth is not a single research category of education, economics and sociology, but a comprehensive consideration of China's actual national conditions, combined with the development of the status quo in various fields (Liu, 2022). In the context of promoting the realization of common wealth, some scholars believe that educational equity can be effectively promoted by balancing the rational distribution of educational resources and that educational equity is a basic requirement for promoting the realization of common wealth (Ma and Xie, 2022). The common wealth in the new era is the comprehensive wealth of the people in both material and spiritual dimensions, and education, as an important content of the common wealth, is also an important driving force for the realization of the common wealth, so this paper focuses on the study of the realization mechanism of education for the common wealth.

This paper has combed through the relevant literature and found that the literature on education for common wealth is mainly centered on educational equity, economic growth and distribution patterns. The first is the category of educational equity, which is often mentioned simultaneously with comprehensive human development, and scholars believe that achieving comprehensive human development is the core issue of realizing common wealth, as well as the ultimate goal pursued by educational equity (Ren and Huo, 2017; Luan, 2022), and that educational equity is an important embodiment of social fairness, which is the micro-foundation for realizing common wealth (Hou, 2022; Zhang and Xia, 2022). From this point of view, the promotion of educational equity and the realization of common wealth are highly compatible.

Secondly, there is the category of economic growth, which mainly focuses on economic domestic demand, economic double cycle, labor productivity, etc. It is found that education plays an important role in promoting economic growth, whether from the perspective of boosting domestic demand, stimulating consumption, optimizing the consumption structure, or from the perspective of the "double cycle" and opening of education to the outside world (Li et al., 2021b; Min et al., 2021; Xue et al., 2021; Xing et al., 2022). Economic growth is an inevitable requirement for realizing common prosperity, therefore, education can contribute to the realization of common prosperity by fueling economic growth.

Finally, the distribution pattern category, here mainly discusses the relationship between education and income gap, domestic scholars do not have the same view on this, one believes that the expansion of colleges and universities, education equalization and other educational means can effectively reduce the income gap, and the role of education on the income gap effect is divided into the economic effect and the technical effect, put forward the higher the level of economic development, the more obvious the effect of education to promote the narrowing of the income gap, the technical effect on its performance is first increased and then reduced (Xiong and Zhang, 2010; Fan et al., 2020); the other believes that the inequitable distribution of public education expenditures exacerbates the income distribution gap, i.e., the reduction of educational inequality has not promoted the reduction of the income distribution gap. At the same time, they also put forward the view that education expansion is conducive to controlling the income gap and attribute the above phenomenon to the insufficient reduction of education inequality and the insufficient level of education expansion. In other words, to further reduce the income gap, it is necessary to establish a long-term mechanism in which educational inequality continues to diminish and educational expansion further increases (Yang and Huang, 2010; Li et al., 2018).

From the essential connotation of common wealth, scholars believe that the core issue of common wealth is to narrow the income gap (Liu et al., 2021; Li and Zhu, 2022; Wan et al., 2022), and put forward the viewpoint of "raising the income of low-income groups, expanding the middle-income groups, and adjusting the income of high-income earners" (Li, 2021a; Huang, 2022; Sun and Cao, 2022). In view of this, this paper argues that we can control and narrow the income gap by means of education, such as expanding the enrollment of colleges and universities, and effectively improve the employment rate, optimize the level of labor force, stimulate economic growth, and enhance the level of scientific and technological innovation by means of promoting educational equity, extending the average years of schooling, and increasing investment in education, so as to effectively promote the realization of the common wealth.

Existing studies have directly or indirectly discussed whether education can contribute to the realization of common prosperity from the relationship between education equity and common prosperity, education, economic growth and common prosperity, and education, distribution pattern and common prosperity. It is found that the existing literature holds a positive view on the promotion of education to realize common wealth, but does not argue how education can promote the realization of common wealth, which provides important insights for this paper, therefore, this paper focuses on the study of the mechanism of education to promote the realization of common wealth, and develops a discussion based on the perspective of panel data and empirical analysis, in order to answer the above questions.

3 Index construction and measurement

3.1 Measurement of the coefficient of shared prosperity

Regarding the essential connotation of common wealth, the existing literature has formed a unanimous conclusion that common wealth should be grasped from the two aspects of "common" and "affluence" (Liu et al., 2021; Li, 2021a; Wan et al., 2022). The Gini coefficient can be used to characterize "common," while "affluence" mainly emphasizes the degree of people's affluence, so the Engel coefficient is chosen to measure "affluence," and the weighted index of the Gini coefficient and Engel coefficient is used, which is defined as the coefficient of common affluence in this paper and used to measure "common affluence." This paper defines it as the coefficient of common wealth and uses it to measure the degree of realization of "common wealth." In this paper, the Gini coefficients of 31 provinces and cities (Hong Kong, Macao and Taiwan are excluded from the scope of the study due to incomplete data) for the nine-year period from 2012 to 2020 are firstly measured. The formula for calculating the Gini coefficient is as follows:

$$G = \frac{1}{2\mu N^2} \cdot \sum_{i=1}^{N} \sum_{j=1}^{N} \left| y_i - y_j \right| \tag{1}$$

In Equation (1), G represents the Gini coefficient, μ is the expected value of the overall income of each subgroup, N is the number of observations, and y_i is the income of individual i. The Gini coefficient for each province is calculated using Equation (1) to characterize the degree of Common prosperity, the results of which are presented in the Supplementary Appendix Table A2. the Engel coefficient is calculated using a simpler process and is therefore not described, the results are presented in the Supplementary Appendix. the formula for calculating the Common prosperity coefficient is as follows.

$$CP_i = 1 - \left(W_i G + W_i EC \right) \tag{2}$$

In Equation (2), CP_i represents the degree of common prosperity achieved, W_i represents the weights, G is the Gini coefficient and EC represents the Engel coefficient. The results of the common prosperity measure are presented in appendix.

3.2 Education index measurement

The indicators selected in this paper to measure the level of education development are education expenditure (RMB million), education expenditure, teacher-student ratio of general primary schools, teacher-student ratio of general junior high schools, teacher-student ratio of general senior high schools, teacher-student ratio of secondary vocational schools, teacher-student ratio of general tertiary schools, number of general tertiary schools, number of general senior high schools, number of secondary vocational schools, number of general junior high schools and number of general primary schools. The indicators are assigned weights using the entropy method and Equation (3) is applied to calculate the composite education index.

$$Edu_i = \sum_{i=1}^{n} W_i X_i \tag{3}$$

In Equation (3), Edu_i represents the education development level index, W_i represents the weight of the ith indicator, and X_i represents

the score of the i indicator. The results of the measurement of the education development level index are shown in the Appendix.

3.3 Measurement of Gini coefficient for education

This paper uses the Gini coefficient of education to measure educational inequality, which is calculated as follows.

$$E_i = \frac{1}{\mu}\sum_{i=2}^{n}\sum_{j=1}^{j-1} p_i \left| y_i - y_j \right| p_j \quad (4)$$

Where μ is the average number of years of education in the group, $\mu = \sum x_i n_i / \sum n_i$, n_i is the number of respondents in group i, and x_i represents the number of years of education in group i. For example, the number of years of education in primary school is taken as 6. p_i in Equation (4) represents the ratio of respondents in group i to the total population, and p_j represents the ratio of respondents in group j to the total population. The ratio of respondents in group j to the total population. Based on data from the China Labor Statistics Yearbook, this paper measured the education Gini coefficient and the average years of schooling in 2012, 2014, 2016, 2018 and 2020 as shown in Appendix.

4 Research hypothesis and analytical framework

Combining the existing research and the above discussion, this paper puts forward the realization mechanism of education for common prosperity, identifies four intermediary variables, namely, unemployment rate, economic growth rate, labor force level and level of scientific and technological innovation, and puts forward four ways for education to promote the realization of common prosperity by increasing the labor force participation rate and lowering the unemployment rate; education promotes the economic growth rate through increasing the investment in education, which in turn promotes the realization of common prosperity; education improves the level of labor force, which greatly improves labor productivity, and thereby contributes to the realization of common prosperity; and education improves the level of scientific and technological innovation through the cultivation of human resources to promote the realization of common prosperity.

The level of educational development is closely related to the level of scientific and technological innovation. Science and technology are the first productive force, technological progress will further improve labor productivity, and the development of science and technology depends on the training of talents, training many innovative talents is the goal of China's education in the new era, therefore, the level of education development and the level of scientific and technological innovation is closely related. Some studies show that the level of education development has a positive effect on the level of scientific and technological innovation. Chen et al. (2022b) explored the relationship between the aggregation effect of higher education institutions and the number of "small giant" enterprises and found that the knowledge spillover effect of higher education can effectively promote the cultivation of "small giant" enterprises, and this spillover effect will be extended to neighboring cities. It is found that the knowledge spillover effect of higher education can effectively promote the cultivation of "small giant" enterprises, and this spillover effect will be extended to the neighboring cities. The new university organization, which breaks away from the traditional teaching and scientific research, is effectively coordinating the allocation of higher education resources and gradually transforming into a "power source" and "accelerator" of regional economic development, thanks to its "industry-university-research" deep integration. This is due to the vitality of scientific and technological innovation stimulated by the in-depth integration of "industry, academia and research" (Que and Gu, 2022). Meanwhile, building the world's largest higher education system and constructing a world-important talent centre and innovation highland is also an important thesis put forward by General Secretary Xi Jinping at the education level (Luo and Gui, 2022). Therefore, the integration of education into the national science and technology innovation system is also an inevitable requirement for China to build an innovative country (Liu, 2018).

Science and technology innovation, as the fundamental guarantee of high-quality development, will play an important supporting and leading role in promoting the process of realizing common wealth (Li, 2021b). Zhang and Xia (2022) proposed that science and technology for the good and innovation leadership is a necessary way to achieve common wealth, that the two can not only bring about income growth and reasonable income distribution, but also promote the realization of common wealth. Chen et al. (2022a) believe that the realization of common wealth cannot be achieved without the effective support of science and technology innovation strategy and science and technology innovation system, and on this basis put forward a new paradigm of innovation transformation in the three dimensions of "government-society-enterprise". Based on the above paradigm, this paper puts forward research hypothesis 1.

> *H1:* Education can raise the level of science, technology and innovation and provide an important support and leadership role in promoting the achievement of common prosperity.

Income levels, individual capabilities and education levels are all closely related, and all three of these are interlinked with the degree to which the Common prosperity is achieved. In terms of the path to common prosperity, the difficulty lies in improving the capabilities of the less affluent (Zhou and Shi, 2022), and the key to improving the capabilities of the less affluent lies in education and training. Studies have shown that higher education has a significant impact on the improvement of individual capabilities, and that work experience, capabilities and education are significantly and positively correlated with income levels, i.e., higher education increases both individual capabilities and income levels (Li, 2010), so it is easy to see that both income levels and individual capabilities are closely related to education levels, and all three of these are interlinked with the degree of achievement of Common prosperity. The level of education directly or indirectly determines the level of China's labor force. Combined with the fact that China's labor force is ageing, the labor supply is insufficient, the labor force participation rate is low, and the size of the labor force continues to decline, the level of the labor force has to be raised rapidly, and the level of the labor force can to some extent increase labor productivity, which will undoubtedly contribute to

further economic growth (Li, 2020). Other scholars argue that in this context, the increase in labor force level has a significant role in economic growth and that basic public services such as education are an important source of economic growth (Li, 2020; Mao and Li, 2021).

The increase in the level of labor force is conducive to the promotion of common prosperity. The core of achieving common prosperity is to achieve comprehensive human development, and the Chinese government has always upheld the policy of "giving people fish is better than giving them fish," which means that to achieve common prosperity for all people, the long-term development of the population to be enriched must first be addressed. The efforts are made to "help the wisdom," "help the will" and "combine the wisdom and the will" (Jiang and Wu, 2022; Lin M. G., 2022), and "help the wisdom," "help the will" and "combine the wisdom and the will" are inseparable from education. Education is inseparable from "helping the intellect," "helping the will" and "combining the intellect and the will." Therefore, this study argues that education contributes to the achievement of common prosperity by raising the level of the labor force and chooses to characterize the level of the labor force by the proportion of undergraduates among the employed. In this context, this paper proposes research hypothesis 2.

> *H2:* Education provides an important source of dynamism by raising the level of the workforce and contributing to the achievement of shared prosperity.

A higher level of education in society is conducive to reducing unemployment. In terms of the distribution pattern for achieving common prosperity, expanding the middle-income group is an appropriate and important step toward achieving common prosperity. Liu et al. (2022) classify the income range of a typical Chinese middle-income family of three as "100,000 to 500,000 yuan" according to the absolute criteria of the middle-income group by the National Bureau of Statistics in 2018. According to the typical "family of three" in China, 66.67% of the three people must be employed, which is difficult to achieve for rural farmers and other groups with relatively low education levels. Therefore, this paper argues that to increase the income of the middle-income group, the employment rate must be increased, and that increasing the employment rate and reducing the unemployment rate are also the cornerstones of stable social development (Wu and Chen, 2021).

Reducing unemployment not only gives people a material basis for living, but also contributes to social harmony and stability, enhances the sense of well-being, and promotes the process of common prosperity. In terms of the connotation of common prosperity, common prosperity is a prosperity that includes both material and spiritual prosperity, and employment can bring people a sense of prosperity and happiness in their spiritual life while gaining income to satisfy their material prosperity (Sameem and Buryi, 2022). Therefore, employment and common prosperity are closely linked, and it is particularly important to study the unemployment rate on this basis. Some scholars have studied the educational level characteristics of the unemployed and found that the unemployment rate is inversely proportional to the educational level, i.e., the higher the educational level of the group the lower its unemployment rate (Huang et al., 2021). In addition, reducing unemployment is also an important way to improve social welfare (Zhu et al., 2021). Vigorous development of education and training to improve the quality of workers and promote labor force participation is also a proposed path to achieve common prosperity in the context of China's basic national conditions of slowing population growth (Lin B., 2022). Therefore, this paper uses unemployment rate as a mediating variable to examine the relationship between education level, unemployment rate and Common prosperity. Based on the above discussion, this paper proposes research hypothesis 3.

> *H3:* Education reduces labor unemployment through training and other means, and provides an important social welfare guarantee to promote the achievement of common prosperity.

In terms of the focus and key to achieving common prosperity in the new era, the focus of achieving common prosperity is "prosperity" and the key is "development," and the prerequisite is sustainable and high-quality development (Li and Zhu, 2022; Wan et al., 2022). The most direct indicator that can adequately cover the term "development" and "affluence" is "economic growth "The most direct indicator that can adequately cover the term 'development' and 'affluence' is 'economic growth'. So, what role does education play in promoting economic growth? Foreign studies show that both secondary education and higher education play a positive role in regional GDP growth, while basic education plays a negative role in regional economic growth (De Clercq and Simms, 2019; Karatheodoros et al., 2019), while domestic scholars have shown that the role of education levels on economic growth is positively significant after the reform and opening (Xiong and Li, 2022).

The established literature mainly focuses on domestic demand, the double cycle of the economy and labor productivity as the main entry points and finds that education plays an important role in promoting economic growth, whether from the perspective of boosting domestic demand, stimulating consumption, and optimizing the consumption structure, or from the perspective of the "double cycle" and the opening up of education to the outside world (Min et al., 2021). In particular, the role of doctoral education in promoting economic growth has become increasingly prominent in recent years (Guo et al., 2022). Therefore, this paper argues that education can promote economic growth, and economic growth is an inevitable requirement for achieving common prosperity. Therefore, this study uses economic growth rate (GDP growth rate) as a mediating variable to examine the relationship between education, economic growth, and common prosperity. Based on the above discussion, research hypothesis 4 is proposed in this paper.

> *H4:* Education contributes to economic growth through, for example, investment in education, thereby contributing to the achievement of shared prosperity.

In summary, this paper argues that there are four main mechanisms through which education contributes to the achievement of common prosperity: firstly, education contributes to the achievement of common prosperity by raising the level of scientific and technological innovation and improving labor productivity; secondly, education indirectly contributes to the achievement of common prosperity by raising the level of the labor force, optimizing the knowledge structure of the labor force and increasing labor output; thirdly, education can increase the labor force participation rate, reduce the unemployment rate and improve social welfare thereby

contributing to the achievement of common prosperity; fourthly, education contributes to the achievement of common prosperity by promoting local economic growth through educational investment and other means (Figure 1).

5 Study design and data description

5.1 Selection of variables and description of data

To study the mechanism of the impact of education on shared prosperity, this paper selects data from a sample of 31 provinces and cities in China from 2012 to 2020 for analysis. The relevant variables are specified as follows.

i The degree of Common prosperity realization, which is the explanatory variable in this paper, and the Gini coefficient measured in subsection (i) of Part IV of the article is selected to characterize the degree of Common prosperity realization.

ii Education level. There are four major elements in education resources, namely education funding, education expenditure, student-teacher ratio, and number of schools. According to the above four major elements, this paper selects education funding income, education expenditure, teacher-student ratio of general primary schools, teacher-student ratio of general junior high schools, teacher-student ratio of general senior high schools, secondary vocational schools, general higher education schools, number of general higher education schools, number of general senior high schools, secondary vocational schools, general higher education schools, general senior high schools, number of general senior high number of schools, number of secondary vocational schools, number of general junior secondary schools, and general primary schools, to measure the education index as a way to characterize the level of education.

iii Control variables. 1. labor force level. It is generally believed that the higher the number of years of education, the higher the level of labor force (Zhan, 2014), so this paper uses the average number of years of education to characterize the level of labor force.2. Level of economic development. The economic level mainly focuses on the four dimensions of local finance, residents' income, residents' expenditure and the gap between the rich and the poor, and 24 indicators such as GDP, residents' disposable income, urban residents' *per capita* disposable income, rural residents' *per capita* disposable income, residents' *per capita* consumption expenditure, Engel's coefficient and the multiplier difference of residents' *per capita* disposable income are selected to characterize the level of economic development with a comprehensive index composed of the above 24 indicators 3. The level of livelihood development. The level of people's livelihood is often related to social security and employment, social and public services, health care and so on. In this article, we have found some representative indicators from the above three aspects, respectively. Specifically, social security and employment uses a composite of 11 indicators, including social security and employment expenditure (RMB million), the number of employees covered by basic medical insurance (one), the number of employees covered by work injury insurance (one), the number of persons covered by unemployment insurance, the number of persons covered by maternity insurance, the number of recipients of unemployment insurance, the number of persons employed in urban units, the number of persons registered as unemployed in urban areas, and the number of persons covered by basic pension insurance for urban workers on the job The indicator is used to represent the number of people covered by social security. Social public services are characterized by a composite of 14 tertiary indicators, including public security expenditure (RMB 10,000), urban and rural community affairs expenditure (RMB 10,000), environmental protection expenditure (RMB 10,000), the number of public libraries (RMB 10,000) and the comprehensive population coverage rate of broadcasting programs. Another 15 indicators were selected for health care, including the number of health care institutions (one), the number of health personnel (one), the number of health technicians per unit of population (one/thousand), and the

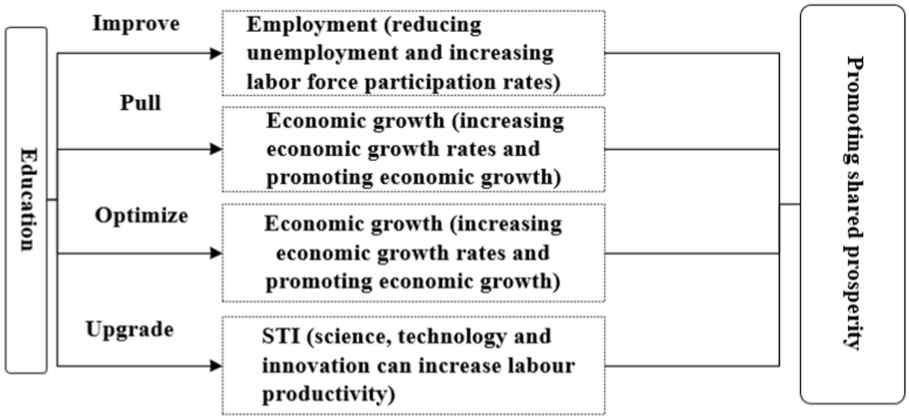

FIGURE 1
Education as a mechanism for achieving shared prosperity.

bed occupancy rate (%), etc. The same synthetic indicators were used here. 4. Level of innovation development. The indicators of innovation development mainly refer to science and technology innovation, and the commonly used indicators are R&D expenditure of industrial enterprises above the scale (RMB billion), the number of R&D topics of industrial enterprises above the scale (items), the equivalent full-time equivalent of R&D personnel of industrial enterprises above the scale (person-years), the number of domestic patent applications (pieces), the number of invention patent applications by domestic applicants (pieces), and the number of patent applications granted (pieces). The synthesis process is like the synthesis of the Common prosperity Index and the Education Development Index and will not be repeated here.

The data of the above indicators are obtained from China Statistical Yearbook, China Labor Statistics Yearbook, China Education Statistics Yearbook, National Bureau of Statistics and China Economic Network. This paper collects and collates the data of each indicator from 2012 to 2020. The level of labor force is characterized by the average years of education (AYS), while the level of economic development, the level of livelihood development and the level of innovation development are all characterized by synthetic indicators. Due to space constraints, the results of the three synthetic indicators are not listed here, but readers can request them from the authors if they are interested.

5.2 Study design

To examine the impact of education on the process of achieving shared prosperity, an individual fixed effects model is used to examine the impact of education on shared prosperity, considering that the actual situation varies from province to province and that there may be omitted variables that do not vary over time. Also considering that there may be omitted variables that do not vary with individuals but vary over time, time effects are added to capture the effects of technological progress. The baseline model was set as.

$$CP_{it} = \alpha X_{it} + \beta Control_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (5)$$

Where the subscript $i\left(i = 1,2,.31\right)$denotes the i_{th} province, and the subscript t $t\left(t = 2012,2013,\ldots 2020\right)$ denotes the year t; CP_{it} denotes the Common prosperity index of province i in year t; X_{it} is the core explanatory variable of this paper, which in turn denotes the level of education development (Edu), cultural effect (Culture), science and technology innovation (Innovation), education inequality (Gini), and average years of schooling (AYS) of province i in year t; $Control_{it}$ is a series of control variables. Innovation, Gini, and AYS; $Control_{it}$ is a set of control variables, including Finance, Employment, Services, and Medical; u_i is a fixed effect that does not vary over time. Fixed effects that do not vary with time, λ_t is a time effect that does not vary with individuals, ε_{it} is a perturbation term that varies with individuals and time, and $\{\varepsilon_{it}\}$ is assumed to be independently and identically distributed and uncorrelated with u_i.

Considering that education is a public service with two main characteristics: spatial externality and time spillover, this paper introduces an interaction term between education measures and time to examine the time effect of the impact of education on the process of achieving Common prosperity. The model is set up as follows.

$$CP_{it} = \omega X_{it} * t + \beta Control_{it} + u_i + \lambda_t + \varepsilon_{it} \quad (6)$$

Where t denotes the period (2012 as period 1, and so on), $Edu_{it} * t$ as t denotes the interaction term between the education measure and time, and the other variables are explained as in Equation (5).

Further, on the basis of Equation (5), the interaction term between the education development level measure and whether the province has a quality education development level is introduced to examine whether the impact of education resources on the process of achieving Common prosperity is affected by different education levels, i.e., whether access to quality education resources has an impact on the process of achieving Common prosperity (Yang et al., 2021).

On the road to achieving common prosperity for all people in China, Zhejiang Province, as a model zone for common prosperity, is organizing various forms of education communities, such as "integration," "co-construction" and "collaboration," and is expected to complete full coverage by the end of 2022.

6 Empirical analysis

6.1 Baseline regression

The results are presented in model (1) in Table 1. The selected control variables Finance, Employment, Services and Medical have a significant positive effect on Common prosperity. Secondly, in the basic regression, we introduce the level of education development (*Edu*), culture, innovation, Gini coefficient and average years of schooling (*AYS*) to analyze the impact of education development level on the process of achieving Common prosperity, and the results are shown in columns (2) to (4) of the model in Table 1. The level of educational development has a positive effect on the realization of the Common prosperity, as shown by the fact that for every 0.734% increase in the level of educational development, the Common prosperity index increases by 1%, and similarly, for every 0.749% increase in the cultural effect, the Common prosperity index increases by 1%. Science and technology innovation has the most obvious role in promoting common prosperity. To investigate the role of the current level of educational inequality in the achievement of common prosperity, the number of schools and the student-teacher ratio of schools on the degree of common prosperity, this paper introduces Gini, and finds that educational inequality has hindered the process of achieving common prosperity to a certain extent, the results are shown in column (5) of Table 1. The results are presented in column (5) of Table 1. The average educational attainment in employment also has a negative effect on the process of achieving the Common prosperity, as shown in column (6) of Table 1. This finding suggests that the level of education plays a positive role in the process of achieving common prosperity, i.e., that the promotion of quality education can effectively accelerate the process of achieving common prosperity, but it also reveals that the average level of education of the working population in China is still low, in other words, the process of achieving common prosperity will be limited if the level of education of our population is not improved in time. In general, the level of education, culture, science, and technology innovation can

TABLE 1 Results of measuring the extent to which shared prosperity is achieved.

Area	2013	2014	2015	2016	2017	2018	2019	2020
Beijing	0.7160	0.7215	0.7382	0.7519	0.7574	0.7628	0.7717	0.7638
Tianjin	0.6485	0.6550	0.6766	0.6905	0.7125	0.7281	0.7402	0.7250
Hebei	0.5839	0.6171	0.6486	0.6757	0.6898	0.7079	0.7223	0.7205
Shanxi	0.5739	0.6060	0.6333	0.6589	0.6761	0.6857	0.6973	0.6957
Mongolia	0.6009	0.6223	0.6375	0.6475	0.6556	0.6669	0.6776	0.6729
Liaoning	0.6132	0.6311	0.6495	0.6753	0.6836	0.7030	0.7139	0.7042
Jilin	0.5687	0.5975	0.6165	0.6367	0.6507	0.6699	0.6793	0.6728
Heilongjiang	0.6014	0.6318	0.6479	0.6738	0.6917	0.7100	0.7218	0.7154
Shanghai	0.6704	0.6879	0.6988	0.7204	0.7343	0.7466	0.7552	0.7480
Jiangsu	0.6090	0.6324	0.6522	0.6636	0.6780	0.6928	0.7068	0.7026
Zhejiang	0.5966	0.6150	0.6430	0.6612	0.6761	0.6946	0.7104	0.7038
Anhui	0.5037	0.5412	0.5886	0.6257	0.6461	0.6707	0.6959	0.6899
Fujian	0.5413	0.5701	0.5976	0.6207	0.6375	0.6595	0.6794	0.6754
Jiangxi	0.5230	0.5733	0.6136	0.6345	0.6573	0.6761	0.7018	0.6986
Shandong	0.5820	0.6203	0.6505	0.6755	0.6936	0.7126	0.7273	0.7273
Henan	0.5802	0.6097	0.6327	0.6550	0.6699	0.6888	0.7025	0.7007
Hubei	0.5573	0.5775	0.6152	0.6471	0.6626	0.6923	0.7115	0.6958
Hunan	0.5263	0.5709	0.6037	0.6292	0.6478	0.6674	0.6845	0.6860
Guangdong	0.5126	0.5451	0.5868	0.6117	0.6275	0.6501	0.6754	0.6722
Guangxi	0.4857	0.5312	0.5761	0.5967	0.6189	0.6434	0.6639	0.6627
Hainan	0.4673	0.5164	0.5602	0.5941	0.6160	0.6490	0.6763	0.6670
Chongqing	0.4954	0.5431	0.5791	0.6031	0.6277	0.6462	0.6648	0.6682
Sichuan	0.4867	0.5436	0.5872	0.6147	0.6401	0.6634	0.6869	0.6868
Guizhou	0.4831	0.5396	0.5784	0.5948	0.6175	0.6382	0.6539	0.6528
Yunnan	0.4960	0.5536	0.6035	0.6214	0.6367	0.6586	0.6827	0.6843
Xizang	0.3785	0.4435	0.4814	0.4516	0.5160	0.5829	0.6367	0.6147
Shaanxi	0.5557	0.5791	0.6065	0.6226	0.6411	0.6577	0.6730	0.6693
Gansu	0.4944	0.5294	0.5668	0.6024	0.6199	0.6431	0.6597	0.6595
Qinghai	0.5313	0.5535	0.5854	0.6063	0.6192	0.6375	0.6472	0.6512
Ningxia	0.5602	0.5891	0.6203	0.6467	0.6529	0.6630	0.6763	0.6705
Xin Jiang	0.5396	0.5452	0.5807	0.6213	0.6299	0.6476	0.6722	0.6607

contribute to the achievement of common prosperity, while educational inequality and the low average number of years of schooling can slow down the process of achieving common prosperity.

The above analysis suggests that the level of educational development, cultural effects and technological innovation contribute to the degree of shared prosperity, while educational inequality and low average years of schooling have a negative impact on the degree of shared prosperity. Do these two effects become more pronounced over time? To answer this question, this paper introduces the 'cumulative' effect over time and explores it as follows.

As can be seen from Table 2, the current level of educational development, the cultural effect and the level of scientific and technological innovation still have a certain contribution to the achievement of common prosperity over time, as shown in columns (1)–(3) of Table 2, but this effect decreases over time. Educational inequality and the current low average level of education also have a cumulative effect over time, and both have a dampening effect on the process of achieving shared prosperity, as shown in columns (4) and (5) of Table 2. It is important to note that the time 'cumulative' effect of the current average years of schooling (AYS) in China is more significant in inhibiting the achievement of common prosperity. This suggests that to promote the achievement of common prosperity for all people, it is necessary to have a matching level of educational development, and that the number of years of compulsory education should be appropriately extended to increase the average number of years of education for all people.

6.2 Heterogeneity analysis

Studies by other scholars have shown that the unbalanced and insufficient development of education caused by the uneven

TABLE 2 Gini coefficient for education.

Year	2020		2018		2016		2014		2012	
Area	AYS	Gini	AYS	Gini	AYS	Gini	AYS	Gini	AYS	Gini
Beijing	13.965	0.028	13.604	0.051	13.392	0.051	13.439	0.048	13.331	0.052
Shanghai	12.808	0.028	12.794	0.066	12.573	0.066	12.458	0.069	11.711	0.062
Anhui	9.494	0.046	9.231	0.124	9.065	0.124	9.027	0.13	8.923	0.14
Fujian	10.291	0.064	10.164	0.137	9.926	0.078	9.971	0.158	9.854	0.175
Gansu	9.129	0.064	9.37	0.132	9.151	0.132	9.071	0.141	8.89	0.145
Guangdong	10.926	0.052	10.794	0.106	10.674	0.106	10.29	0.114	9.98	0.114
Guangxi	9.88	0.074	9.645	0.031	9.635	0.133	9.409	0.141	9.241	0.136
Guizhou	8.689	0.075	8.267	0.184	8.13	0.184	8.481	0.184	8.313	0.173
Hainan	10.509	0.085	10.146	0.087	9.953	0.088	10.139	0.095	9.915	0.123
Hebei	10.298	0.054	10.301	0.102	10.191	0.102	9.748	0.184	9.762	0.109
Henan	10.096	0.057	9.946	0.106	9.768	0.104	9.718	0.107	9.374	0.101
Heilongjiang	10.158	0.048	10.104	0.083	10.184	0.083	9.493	0.087	9.275	0.084
Hubei	10.139	0.043	10.05	0.035	9.961	0.08	9.967	0.082	9.731	0.086
Hunan	10.602	0.046	10.271	0.08	10.06	0.08	10.144	0.085	10.087	0.081
Jilin	10.15	0.04	10.181	0.105	10.029	0.105	9.796	0.111	9.549	0.12
Jiangsu	10.73	0.042	10.799	0.087	10.635	0.087	10.052	0.093	10.002	0.094
Jiangxi	9.747	0.083	9.727	0.133	9.557	0.133	9.514	0.133	9.408	0.148
Liaoning	10.566	0.047	10.449	0.093	10.482	0.093	10.128	0.097	9.795	0.094
Neimeng	10.566	0.061	10.449	0.059	10.482	0.059	10.128	0.079	9.976	0.086
Xizang	7.054	0.156	6.423	0.165	6.488	0.191	6.732	0.199	6.677	0.206
Ningxia	10.235	0.055	10.084	0.14	9.784	0.262	8.959	0.27	9.137	0.273
Chongqing	10.379	0.052	9.991	0.161	9.799	0.161	9.343	0.141	9.221	0.162
Zhejiang	10.836	0.379	10.832	0.087	10.597	0.082	10.142	0.096	9.848	0.09
Yunnan	8.929	0.061	8.631	0.154	8.425	0.154	8.447	0.17	8.241	0.18
Xinjiang	10.545	0.043	10.604	0.082	10.317	0.082	9.747	0.112	9.694	0.115
Tianjin	12.312	0.032	12.072	0.059	11.759	0.059	11.625	0.058	11.196	0.06
Sichuan	9.495	0.073	9.054	0.166	9.097	0.091	9.188	0.179	8.989	0.183
Shanxi	10.744	0.053	10.375	0.098	10.546	0.098	10.231	0.104	10.204	0.104
Shandong	9.98	0.046	10.12	0.107	9.978	0.118	10.009	0.121	9.75	0.122
Shaaxi	10.449	0.049	10.471	0.084	10.254	0.084	10.471	0.095	10.449	0.095
Qinghai	9.63	0.079	9.484	0.083	9.249	0.083	9.192	0.095	9.159	0.098
Average	10.303	0.05	10.174	0.106	10.03	0.106	9.85	0.117	9.66	0.108

distribution of educational resources is the most important problem of education in China, and it is mainly manifested in the regional, urban, and rural areas (Gong, 2021; Yang et al., 2021). Does the regional imbalance and insufficiency of education development have different effects on the degree of achieving common prosperity? To this end, this paper divides China's 31 provinces and cities into eastern, central, western, and northeastern regions, thus conducting a heterogeneity analysis, and the regression results are presented in Table 3.

From the central region, the level of education development, cultural entertainment effect and science and technology innovation all have a significant positive effect on the degree of realization of common prosperity, which provides sufficient arguments for the realization path of common prosperity, that is, the first step is to vigorously develop education, promote education equalization, further enhance the cultural soft power to make people spiritually rich, and science and technology innovation should still be placed in the first place. From the eastern region, the regression coefficients of education development level and science and technology innovation are significantly positive, indicating that they have a significant contribution to the process of realizing common prosperity. The eastern region, because it includes places such as North, Shanghai, Guangzhou, Jiangsu and Zhejiang, has a higher level of education development in recent years and its economic development is at the leading level in the country, so for the eastern region, its education development level and science and technology innovation have a

TABLE 3 Engel's coefficient.

	2013	2014	2015	2016	2017	2018	2019	2020
Average	0.483896	0.419849	0.358386	0.314049	0.281136	0.242481	0.208448	0.219423
Beijing	0.287017	0.272917	0.238587	0.213151	0.203298	0.190354	0.173515	0.193454
Tianjin	0.417069	0.402081	0.357889	0.330931	0.288082	0.257831	0.231578	0.265034
Hebei	0.459199	0.391879	0.327787	0.274631	0.247399	0.210232	0.181446	0.187925
Shanxi	0.43114	0.367938	0.314449	0.262148	0.226728	0.208601	0.185373	0.191636
Neimeng	0.382189	0.339357	0.30994	0.288026	0.272835	0.250178	0.228815	0.244164
Liaoning	0.408697	0.370712	0.333016	0.282348	0.26671	0.227027	0.205145	0.227669
Jilin	0.416582	0.358928	0.320941	0.280526	0.252624	0.214152	0.195382	0.208316
Heilongjiang	0.439238	0.374436	0.34122	0.291365	0.256588	0.217965	0.19534	0.212296
Shanghai	0.369235	0.331247	0.308427	0.267121	0.24035	0.213869	0.197601	0.214912
Jiangsu	0.404914	0.357292	0.317665	0.294841	0.266982	0.23737	0.209448	0.219784
Zhejiang	0.432899	0.395925	0.33994	0.303636	0.273798	0.236703	0.205122	0.21641
Anhui	0.595632	0.51853	0.421702	0.349618	0.309821	0.259566	0.209177	0.223213
Fujian	0.518347	0.458817	0.401741	0.35764	0.325046	0.280049	0.240256	0.249184
Jiangxi	0.575024	0.470308	0.387716	0.348913	0.304364	0.264799	0.214487	0.22187
Shandong	0.483937	0.406395	0.345093	0.296056	0.259799	0.221845	0.1925	0.193373
Henan	0.44168	0.380604	0.334581	0.290034	0.261129	0.222415	0.196084	0.203688
Hubei	0.501471	0.459983	0.383564	0.320882	0.290856	0.230318	0.191946	0.224453
Hunan	0.523334	0.434279	0.368675	0.317679	0.280413	0.241149	0.207067	0.208976
Guangdong	0.552741	0.487839	0.404315	0.354694	0.322934	0.277758	0.227276	0.242639
Guangxi	0.58266	0.489688	0.398711	0.358668	0.315286	0.265206	0.224146	0.23357
Hainan	0.671318	0.571127	0.482667	0.415813	0.373019	0.306023	0.251344	0.270908
Chongqing	0.578134	0.482723	0.410899	0.362745	0.31353	0.276671	0.239334	0.237507
Sichuan	0.635603	0.522849	0.435582	0.379567	0.328877	0.283147	0.235191	0.241354
Guizhou	0.555852	0.441795	0.364219	0.331389	0.285969	0.244657	0.213254	0.219436
Yunnan	0.577087	0.461867	0.36195	0.32615	0.295653	0.25177	0.20352	0.202449
Xizang	0.758959	0.654982	0.525176	0.51387	0.438988	0.340255	0.258665	0.275619
Shaanxi	0.429649	0.38283	0.327992	0.295776	0.258878	0.225648	0.194968	0.202425
Gansu	0.53322	0.463209	0.388401	0.317189	0.282102	0.235749	0.202669	0.206054
Qinghai	0.451302	0.407059	0.343215	0.301394	0.275545	0.239062	0.219689	0.213643
Ningxia	0.426523	0.368873	0.306472	0.253678	0.241122	0.221046	0.194329	0.207086
Xinjiang	0.458742	0.423625	0.364611	0.308428	0.279268	0.252812	0.221595	0.240666

greater impact on it, and compared with science and technology innovation The contribution of the cultural effect is not significant compared to that of technological innovation.

In the western region, the effect of education development on common prosperity is significantly positive, while the effect of science and technology innovation is significantly negative. The reason for this is that the economic development level in the western region is relatively backward and the ability of science and technology innovation is insufficient, so its impact on the degree of achieving common prosperity is not significant, while the cultural effect in the western region shows a significant inhibiting effect on the process of achieving common prosperity, which indicates that the development of culture and entertainment in the western region is not enough to support the achievement of common prosperity, so the achievement of common prosperity needs to vigorously develop culture and entertainment in the western region This indicates that the development of culture and entertainment in the western region is not sufficient to support the achievement of common prosperity. The north-eastern region and the eastern region show the same characteristics, i.e., the level of education development and scientific and technological innovation have a more significant role in promoting common prosperity, while the cultural effect is insufficient.

The four regions together show that, firstly, the level of education development has a positive effect on the achievement of common prosperity, further confirming the view that "to achieve the common prosperity of all people, we must first take the first step in education." Secondly, it highlights the importance of science and technology innovation, which is in line with the principle that "science and technology are the first productive force." Finally, due to the differences in geographical location, customs, history and culture, and humanistic

TABLE 4 Results of the common wealth factor.

Area	2013	2014	2015	2016	2017	2018	2019	2020
Beijing	0.7160	0.7215	0.7382	0.7519	0.7574	0.7628	0.7717	0.7638
Tianjin	0.6485	0.6550	0.6766	0.6905	0.7125	0.7281	0.7402	0.7250
Hebei	0.5839	0.6171	0.6486	0.6757	0.6898	0.7079	0.7223	0.7205
Shanxi	0.5739	0.6060	0.6333	0.6589	0.6761	0.6857	0.6973	0.6957
Neimeng	0.6009	0.6223	0.6375	0.6475	0.6556	0.6669	0.6776	0.6729
Liaoning	0.6132	0.6311	0.6495	0.6753	0.6836	0.7030	0.7139	0.7042
Jilin	0.5687	0.5975	0.6165	0.6367	0.6507	0.6699	0.6793	0.6728
Heilongjiang	0.6014	0.6318	0.6479	0.6738	0.6917	0.7100	0.7218	0.7154
Shanghai	0.6704	0.6879	0.6988	0.7204	0.7343	0.7466	0.7552	0.7480
Jiangsu	0.6090	0.6324	0.6522	0.6636	0.6780	0.6928	0.7068	0.7026
Zhejiang	0.5966	0.6150	0.6430	0.6612	0.6761	0.6946	0.7104	0.7038
Anhui	0.5037	0.5412	0.5886	0.6257	0.6461	0.6707	0.6959	0.6899
Fujian	0.5413	0.5701	0.5976	0.6207	0.6375	0.6595	0.6794	0.6754
Jiangxi	0.5230	0.5733	0.6136	0.6345	0.6573	0.6761	0.7018	0.6986
Shandong	0.5820	0.6203	0.6505	0.6755	0.6936	0.7126	0.7273	0.7273
Henan	0.5802	0.6097	0.6327	0.6550	0.6699	0.6888	0.7025	0.7007
Hubei	0.5573	0.5775	0.6152	0.6471	0.6626	0.6923	0.7115	0.6958
Hunan	0.5263	0.5709	0.6037	0.6292	0.6478	0.6674	0.6845	0.6860
Guangdong	0.5126	0.5451	0.5868	0.6117	0.6275	0.6501	0.6754	0.6722
Guangxi	0.4857	0.5312	0.5761	0.5967	0.6189	0.6434	0.6639	0.6627
Hainan	0.4673	0.5164	0.5602	0.5941	0.6160	0.6490	0.6763	0.6670
Chongqing	0.4954	0.5431	0.5791	0.6031	0.6277	0.6462	0.6648	0.6682
Sichuan	0.4867	0.5436	0.5872	0.6147	0.6401	0.6634	0.6869	0.6868
Guizhou	0.4831	0.5396	0.5784	0.5948	0.6175	0.6382	0.6539	0.6528
Yunnan	0.4960	0.5536	0.6035	0.6214	0.6367	0.6586	0.6827	0.6843
Xizang	0.3785	0.4435	0.4814	0.4516	0.5160	0.5829	0.6367	0.6147
Shaanxi	0.5557	0.5791	0.6065	0.6226	0.6411	0.6577	0.6730	0.6693
Gansu	0.4944	0.5294	0.5668	0.6024	0.6199	0.6431	0.6597	0.6595
Qinghai	0.5313	0.5535	0.5854	0.6063	0.6192	0.6375	0.6472	0.6512
Ningxia	0.5602	0.5891	0.6203	0.6467	0.6529	0.6630	0.6763	0.6705
Xinjinag	0.5396	0.5452	0.5807	0.6213	0.6299	0.6476	0.6722	0.6607

background of each region, the role of cultural soft power on common prosperity cannot yet be generalized.

The article also tested the robustness of the model by replacing the explanatory variables, replacing the coefficient of Common prosperity with the Common prosperity index measured using a system of indicators, the process of measuring the Common prosperity indicator system and the Common prosperity index is cumbersome and therefore not listed in the article. The robustness of the model was verified as the findings were similar before and after the replacement of the explanatory variables.

6.3 Endogeneity testing

And the results of the endogeneity test are presented in Table 4, with the instrumental variable being educational inequality (characterized by the Gini coefficient). The first column of Table 4 shows the estimation results of OLS, the second column shows the estimation results of FE, the third column shows the estimation results of the system GMM model, and the fourth column shows the estimation results of differential GMM. The results of the endogeneity test show that the model passes the endogeneity test.

6.4 Mechanism of action tests

According to the previous analysis framework of education on promoting the realization of common wealth, this paper believes that education can achieve common wealth through education to improve employment, education to optimize the level of labor force, education to improve the level of scientific and technological innovation, education to promote economic growth in four aspects, so this paper

TABLE 5 Baseline regression results.

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Educate		0.734*** (0.091)				
Culture			0.749*** (0.085)			
Innovation				1.619*** (0.323)		
Gini					−0.015* (0.009)	
AYS						−0.0008 (0.001)
Finance	1.169*** (0.137)	0.252 (0.221)	0.854** (0.349)	0.467 (0.300)	0.792* (0.408)	0.743* (0.416)
Employment	0.360*** (0.086)	0.512*** (0.143)	0 0.629*** (0.173)	0.407* (0.224)	0.411 (0.282)	0.417 (0.263)
Services	1.687** (0.744)	2.828** (1.079)	0.237 (0.970)	0.300 (0.826)	0.478 (1.093)	1.002(1.161)
Medical	0.813*** (0.065)	0.700*** (0.105)	0.639*** (0.123)	0.627*** (0.111)	0.642*** (0.156)	0.697*** (0.149)
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes
City_FE	Yes	Yes	Yes	Yes	Yes	Yes
N	279	279	279	279	279	279
R^2	0.8639	0.872	0.918	0.8842	0.8962	0.8925

1. Data in parentheses are robust standard errors; 2. *, **, *** denote regression coefficients at 10, 5, 1%, respectively, of the significance level.

from the four aspects of education to improve employment, education to optimize the level of the labor force, education to improve the level of scientific and technological innovation, education to promote economic growth in four aspects, respectively, the selection of the unemployment rate, the percentage of undergraduate, the index of the level of scientific and technological innovation, the growth rate of GDP as a mediator variable to validate the validity of the model, the results of the model test are shown in Table 5.

To test the research hypothesis and realization mechanism proposed in the fourth part of this paper, this paper has done tests on the effect of education development level on unemployment rate, undergraduate student ratio, STI level index and GDP growth rate. It is found that the level of education is significantly and negatively correlated with the unemployment rate, and it shows that for every 1% increase in the level of education, the unemployment rate decreases by 26.23%, and it is significantly and positively correlated with the percentage of undergraduates, the level of science and technology innovation, and the GDP growth rate at different levels (Table 6). Unemployment, the proportion of undergraduates, the index of the level of science and technology innovation, the index of GDP growth and the index of common prosperity are all significant, specifically the unemployment rate significantly inhibits common prosperity, although this inhibitory effect is not significant (the coefficient is only −0.0089), the other three can significantly contribute to the achievement of common prosperity, especially the level of science and technology innovation, the coefficient is 0.64388, indicating that science, technology and This indicates that science, technology and innovation are the most important factors in achieving shared prosperity, and this result is in line with our expectations (Table 7).

The above results show that the four mediating variables selected in this paper, namely unemployment rate, undergraduate student share, STI level index and GDP growth rate, are valid and that the four mechanisms of the effect of education on shared prosperity are also valid (Table 8).

7 Conclusion and insights

7.1 Conclusion

Based on the panel data of 31 provinces and cities in China for the period 2012–2020, this paper measures the education development index to assess the current situation of China's education development by constructing a system of indicators of China's education development level, and also estimates the current education Gini coefficient and the average years of schooling in China; it uses the Gini coefficient and Engel coefficient to design and measure the Common prosperity coefficient from the perspective of "commonness" and "affluence" to characterize the degree of Common prosperity achievement; finally, it uses a two-way fixed effects model to explore the mechanism of education for Common prosperity achievement and draws the following conclusions.

Firstly, the degree of common prosperity is gradually increasing from 2012 to 2020, indicating that the great cause of achieving common prosperity for all people is steadily advancing, and the level

TABLE 6 Results of the 'cumulative' effect over time.

Variable	(1)	(2)	(3)	(4)	(5)
V1*T	0.053* (0.025)				
V2*T		0.067*** (0.007)			
V3*T			0.149*** (0.036)		
LnV4*T				−0.015** (0.001)	
V5*T					−0.0013** (0.000)
C1	0.651* (0.335)	0.547 (0.363)	0.459 (0.333)	0.657 (0.408)	0.948** (0.454)
C2	0.398 (0.250)	0.688*** (0.180)	0 0.512* (0.251)	0.427 (0.288)	0.454** (0.214)
C3	1.688 (1.174)	1.221 (0.921)	1.032 (0.894)	0.906 (1.14)	0.442 (1.067)
C4	0.699*** (0.140)	0.623*** (0.104)	0.668*** (0.123)	0.656*** (0.135)	0.688*** (0.147)
Year_FE	Yes	Yes	Yes	Yes	Yes
City_FE	Yes	Yes	Yes	Yes	Yes
N	277	277	277	277	277
R^2	0.8954	0.9456	0.8901	0.8970	0.8888

1. Data in brackets are robust standard errors; 2. *, **, and *** denote regression coefficients at the 10, 5 and 1% levels of significance, respectively; 3. The control variables are the same as in Table 5. Limited to the size of the table, here V represents the core explanatory variables, C represents the control variables, T represents the time effect, V1 refers to education, V2 refers to culture, V3 refers to science, technology and innovation, V4 represents the Gini coefficient, lnV4 represents the logged Gini coefficient, V5 represents the average years of education, C1-C4 correspond to the control variables in Table 5 and are not explained here.

of education development also shows similar characteristics; from the Gini coefficient of education, China's education inequality still exists, but this inequality is weakening, and education inequality is to a certain extent hindering the achievement of common prosperity. The regression coefficient is −0.015; although the average years of schooling in China has been increasing year by year and has now reached 10.303, it has not played a significant positive role in the achievement of common prosperity, indicating that the average years of schooling in China is still low.

Secondly, the results of the empirical analysis show that the current level of education development plays a significant role in promoting the achievement of common prosperity in the current period, with a regression coefficient of 0.734, but this contribution will be weakened in the next period. The regression coefficient is 0.734, but this contribution is weakened in the next period. This suggests that an education system that can keep pace with the times is necessary to sustain the contribution of education to the achievement of shared prosperity.

Again, from the results of the heterogeneity analysis, the level of education development is a significant contributor to the degree of realization of common prosperity in the four regions of the East, Central, West, and Northeast. Science and technology innovation both play a positive role in the realization process of common prosperity in the East and Northeast, with regression coefficients of 0.018 and 0.081 respectively, while the level of science and technology innovation in the West is not high, with a regression coefficient of −0.618, limiting the In terms of the cultural effect, the cultural effect in the western region also inhibits the process of achieving common prosperity, while the cultural effect in the eastern and northeastern regions is not significant, and only the cultural effect in the central region is significant.

Finally, the mechanism analysis shows that the mechanism of education for common prosperity proposed in this paper is significant, i.e., education can contribute to the achievement of common prosperity by improving the employment situation and increasing the labor force participation rate, boosting the economic growth rate by means of investment in education, optimizing the level of labor force and enhancing the level of science and technology innovation.

7.2 Insights

From the results of this paper's analysis, the level of education development has a significant role in promoting common prosperity, so it is important to vigorously develop education and improve the level of education to promote the achievement of common prosperity for all people. The current level of education still has a significant contribution to the achievement of common prosperity in the current period, but this contribution will be gradually weakened in the following year. This finding indicates that there is still much room for improving the level of education development in China, and the education reform should be further deepened so that the education system can reach a standard that is sufficient to support the process of achieving common prosperity in line with the times. At the same time, the equalization of education should be further promoted, especially the rational distribution of educational resources, so that the distribution of education between regions and urban and rural areas is more balanced and the degree of inequality in education is reduced.

From the results of the regional heterogeneity analysis, promoting the realization of common prosperity should be a multi-step approach for each region, for example, the eastern region and the northeastern region should continue to improve the level of education and scientific and technological innovation, while focusing on the development of cultural soft power, while the western region should develop education while vigorously improving the level of scientific and technological innovation and cultural soft power, riding on the "Western Development The western region should develop education while vigorously improving its level of scientific and technological innovation and cultural soft power, so as to ride on the "Western Development" express and promote common prosperity. The central region, on the other hand, should focus on all aspects of social life, including economy, culture, science and technology innovation, education, and healthcare, to accelerate the promotion of achieving common prosperity.

The level of science and technology innovation, which is the most important factor affecting economic development and education, is the lifeblood of the country. Therefore, education should emphasize the cultivation of students' innovative abilities, further promote the in-depth integration of "industry-university-research" in higher education institutions and improve the level of innovation and development of education and teaching. Only by ensuring absolute equality of educational opportunities can the educational gap between

TABLE 7 Analysis of heterogeneity.

V	East			Northeastern			Middle			West		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
V1	0.0432** (0.140)			0.325** (0.153)			0.078* (0.154)			0.409*** (0.030)		
V2		−0.169 (0.032)			−0.003 (0.009)			0.077** (0.388)			−0.668* (0.457)	
V3			0.018** (0.754)			0.081* (0.079)			2.833** (0.116)			0.517 (0.132)
C1	0.389 (0.084)	1.799* (0.199)	1.826*** (0.388)	0.388** (0.153)	0.642* (0.647)	0.445 (0.043)	−0.803** (0.033)	0.181* (0.204)	−0.031 (0.095)	−0.107* (0.026)	0.545 (0.055)	0.104* (0.126)
C2	0.655** (0.024)	−0.290 (0.388)	0.533* (0.067)	0.831*** (0.153)	0.503* (0.057)	0.025* (0.274)	0.234* (0.543)	0.131* (0.137)	0.583* (0.084)	0.680*** (0.041)	0.0167* (0.017)	0.120* (0.081)
C3	1.818 (0.798)	−2.517 (1.269)	−2.764*** (0.636)	3.251** (2.408)	0.475* (0.456)	0.038** (0.038)	0.579* (0.923)	−0.241 (0.433)	7.359*** (0.126)	0.167* (0.145)	−0.106* (0.024)	0.233* (0.021)
C4	1.641** (0.027)	1.742** (0.003)	0.768*** (0.152)	0.948*** (0.036)	0.796*** (0.003)	0.841*** (0.079)	0.112* (0.104)	0.040* (0.081)	0.607* (0.538)	1.430*** (0.275)	1.608*** (0.248)	1.231*** (0.236)
N	279	279	279	279	279	279	279	279	279	279	279	279
R^2	0.8631	0.7578	0.9023	0.9081	0.9054	0.968	0.859	0.839	0.7991	0.9351	0.8894	0.8491

① Std is the robust standard error; ② *, **, *** denote regression coefficients significant at 10, 5, 1% significance level respectively; ③ control variables are the same as Table 5, limited to the size of the table, V is used here to represent the core explanatory variables and C is used to represent the control variables, V1 refers to education, V2 refers to culture, V3 refers to science and technology innovation, C1-C4 correspond to the control variables in Table 5 one by one and are not explained here.

TABLE 8 Testing the mechanism of the effect of education on shared prosperity.

Variables	Unemployment	Undergraduate ratio	Technology innovation	GDP's growth rates
CP	−0.00089*	0.000174**	0.64388***	0.004*
std	(0.0013)	(0.00007)	(0.1190)	(0.002)
Con Var	Yes	Yes	Yes	Yes
Te	Yes	Yes	Yes	Yes
Te	Yes	Yes	Yes	Yes
t	−0.701	2.20	5.41	1.51
R^2	0.643	0.8843	0.571	0.604
Value	277	277	277	277
Educate	−26.23***	4.103***	0.518***	0.035*
std	(−7.549)	(0.343)	(0.209)	(6.916)
Con Var	Yes	Yes	Yes	Yes
Fe	Yes	Yes	Yes	Yes
Te	Yes	Yes	Yes	Yes
t	−0.474	11.683	6.53	1.31
R^2	0.476	0.575	0.567	0.604
Value	277	277	277	277

① Std is the robust standard error; ② *, **, *** denote regression coefficients significant at the 10, 5, and 1% significance levels, respectively; ③ control variables are the same as Table 5; ④ due to space limitations, only the estimation results of key explanatory variables are reported.

rural and urban areas, western and eastern regions, and remote areas and modern cities not continue to widen. To enhance the soft power of culture, especially to explore the far-reaching influence of traditional culture on modern society, and to further strengthen cultural exchanges and cultural clashes with the West so that culture can become a powerful driving force in the process of achieving common prosperity.

There are still some shortcomings in this paper, firstly, in terms of empirical analysis, the research is centered on the macro data of the provinces, and micro data are not used to examine the micro situation;

secondly, on the measurement of the coefficient of common prosperity, it may not be comprehensive enough to cover the content; lastly, in terms of the research on the path of the realization of the common prosperity, this paper is only carried out from the perspective of education, and neglects the situation of the basic public services such as medical care, and this paper will try to solve the above problems in the future research.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

XW: Data curation, Methodology, Validation, Writing – original draft, Software. JR: Funding acquisition, Writing – review & editing.

Funding

The author(s) declare that financial support was received for the research, authorship, and/or publication of this article. Research on the Theory, Measurement Method, and Governance System of Shared Development to Promote Common prosperity" (22BTJ036), General Project of the National Social Science Foundation of China.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/feduc.2024.1296141/full#supplementary-material

References

Chen, W. Y., Cai, Q. F., and Cheng, Z. J. (2022b). Clustering of higher education institutions, knowledge spillover and cultivation of "small giant" enterprises. *Educ. Res.* 9, 47–65.

Chen, J., Yang, Z., and Zhang, Y. Y. (2022a). Science and technology innovation in China under the perspective of common wealth: logical turn and paradigm innovation. *Reformation* 1, 1–15.

De Clercq, B., and Simms, L. J. (2019). Doing justice to the richness of personality: Introduction to the special issue "New approaches to the measurement of personality: Translational thoughts to applied, educational, and clinical settings". De Clercq Barbara, Simms Leonard J. Psychological assessment.

Fan, X. T., Chen, X. S., and Zhang, N. (2020). A study on the impact of higher education expansion on the income distribution gap of Chinese residents—an empirical analysis based on inter-provincial panel data from 1999-2018. *High. Educ. Manag.* 3, 73–103.

Gong, X. H. (2021). On the right to fair and quality education in the new era. *Educ. Res.* 8, 48–58.

Guo, C. B., Fang, C. C., and He, F. (2022). The impact of doctoral education on economic growth: a perspective based on regional differences in doctoral authorizations. *Educ. Res.* 5, 124–138.

Hou, H. Y. (2022). The realization of equity in community education in the context of common prosperity. *Educ. Dev. Res.* 11:3.

Huang, J. K. (2022). Accelerating the transformation of rural economy, promoting farmers' income, and achieving common prosperity. *Agricul. Econom. Iss.* 7, 4–15.

Huang, G. H., Zheng, C., and Yang, Y. C. (2021). Unemployment rate estimation based on administrative big data: an example of a city of four million people. *Stat. Res.* 38, 145–156.

Jiang, X. P., and Wu, B. J. (2022). People first: the history, achievements, and experiences of improving basic public services in China since the 18th party congress. *Manag. World* 38:56-70.

Karatheodoros, A., Constantinos, T., and Panagiotis, P. (2019). The effects of formal educations' levels on regional economic growth in Greece over the period 1995–2012. *Rev. Reg. Res.* 39, 91–111.

Li, W. (2010). The development of higher education for students: competence enhancement or competence screening. *Beijing Univ. Educ. Rev.* 8, 16–188.

Li, J. (2020). Labor supply and demand pattern, technological progress, and potential economic growth rate in China. *Manag. World* 36, 96–113.

Li, S. (2021a). The goal of common prosperity and the choice of path to achieve it. Economic. *Research* 56, 4–13.

Li, C. C. (2021b). The path of science and technology innovation to help common prosperity. China science and technology. *Forum* 10:3.

Li, F. L., and Wang, Y. Q. (2021). The role of graduate education in innovation-driven economic growth. *Educ. Res.* 42, 23–29.

Li, X. Y., Yu, W. S., and Chen, S. (2018). Public education expenditure and the income distribution gap between residents. *Res. Fin. Econom.* 8, 82–88.

Li, S., and Zhu, M. B. (2022). Advancing the reform of income distribution system and promoting the realization of common prosperity. *Manag. World* 38, 52–62.

Lin, M. G. (2022). An outline of promoting low-income groups towards common prosperity. *Gov. Studies.* 38, 4–124.

Lin, B. (2022). The relationship between negative population growth and labor employment. *Popul. Stud.* 44, 21–37.

Liu, X. H. (2018). Integration of higher education into the national science and technology innovation system: ways, mechanisms, and policy support. *Educ. Res.* 39, 113–121.

Liu, F. X. (2022). Education, and common prosperity: building a high-quality education system for common prosperity. *Educ. Res.* 43, 149–159.

Liu, P. L., Tao, Q., and Huang, X. H. (2021). The connotation, realization path and measurement method of common prosperity. *Manag. World* 37, 117–129.

Liu, S. J., Wang, Z. H., and Jiang, S. J. (2022). Research on the potential, time, and path to achieve the multiplication of middle-income groups. *Manag. World* 38, 54–67.

Luan, H. Q. (2022). Comprehensive human development, educational equity, and common prosperity: logical relationship and policy support. *Learn. Explor.* 14, 145–152.

Luo, J. P., and Gui, Q. P. (2022). Rooted in the land of China: accelerating the construction of socialist universities with Chinese characteristics: study and research on general secretary xi Jinping's important discourse on education. *Educ. Res.* 43, 4–18.

Ma, F. Q., and Xie, A. L. (2022). Balanced and adequate development of education and common prosperity. *Educ. Res.* 43, 148–159.

Mao, Y. B., and Li, D. H. (2021). Study on the hedging effect of population aging and human capital enhancement in economic growth. *West. Forum.* 1, 59–68.

Min, W. F., Yu, J., and Wu, J. Q. (2021). The role of education in expanding domestic demand to stimulate economic growth. *Educ. Res.* 42, 12–22.

Que, M. K., and Gu, J. M. (2022). New university organization and urban symbiotic development. *Educ. Res.* 43, 33–46.

Ren, F. Q., and Huo, Y. Q. (2017). Review of the nature and measurement of educational equity. *Educ. Res.* 38:159.

Sameem and Buryi (2022). Impact of unemployment on happiness in the United States. *Appl. Econ. Lett.* 26, 1049–1052.

Sun, H., and Cao, X. Y. (2022). The coordination of income distribution system and the path of promoting common prosperity. *Quant. Tech. Econom. Res.* 39, 3–24.

Wan, G. H., Jiang, W. W., and Zhao, M. X. (2022). The common wealth effect of urbanization. *China Rural Econom.* 4, 2–22.

Wu, Y. W., and Chen, M. M. (2021). Changes in China's labor force participation rate: continuing decline or already rebounding. *Labor Econom. Res.* 9, 117–140.

Xing, X. B., Mu, G. L., and Xu, J. X. (2022). Population ageing, educational human capital, and economic growth. *J. Shandong Univ. Fin. Econom.* 4, 5–14.

Xiong, X. L., and Li, T. (2022). A study on the income distribution gap in China and its influencing factors. *Stat. Inform. Forum.* 37, 39–52.

Xiong, G. Q., and Zhang, W. D. (2010). Education, and income distribution gap: an empirical study of rural China. *Static Res.* 27, 40–46.

Xue, H. P., Gao, X., and Yang, L. B. (2021). Analysis of the role of education opening to the outside world in promoting economic growth in the context of the "double cycle". *Educ. Res.* 42, 30–44.

Yang, J., and Huang, X. (2010). The intrinsic mechanism of educational inequality and income distribution gap--an analysis based on provincial panel data in China. *J. Public Admin.* 7, 75–82.

Yang, C. R., Zhang, Y. S., and Zhang, H. (2021). Equity in basic education and economic and social development. *Manag. World* 7, 152–166.

Zhan, P. (2014). Education quality and the return to education of rural migrant laborers. *China Rural Econom.* 10, 21–34.

Zhang, Y. Q. (2022). Promoting common wealth through educational justice - vocational education reform empowering the disadvantaged towards common wealth. *Int. J. Educ. Dev.* 42, 1–8.

Zhang, L. M., and Li, J. W. (2021). The connotation, strategic goals, and policy measures of promoting common prosperity. *Reformation* 9, 16–33.

Zhang, Y. X., and Xia, J. C. (2022). Science and Technology for Good Empowerment of common wealth: mechanisms Models and Paths. *Hebei J.* 42, 115–122.

Zhou, H. T., and Shi, Y. Q. (2022). The innovative path of nurturing people in colleges and universities to promote common prosperity. *Thuer* 43, 55–61.

Zhu, G. P., Hu, W. X., and Yang, L. (2021). Measurement of the size of local government contingent liabilities and its impact on social welfare. *Static Inf. Forum* 36, 118–128.