

Analysis On the Relationship Between Education and Regional Economic Development

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Abstract:

This article use meta analysis and case study methods to explores the relationship between higher education and economic development. The study investigates how higher education can act as a catalyst for economic development, focusing on the potential of intellectual capital, technological innovation and international cooperation. Through literature analysis and case analysis, this article emphasizes the positive impact of higher education on regional economic growth and the need to take consistent measures to strengthen this relationship. Therefore, this article puts forward four suggestions: strengthen technology transfer, promote international cooperation, increase educational opportunities and investment to solve the current problem of educational imbalance and promote the long-term harmonious development of higher education and regional economy.

Keywords: Higher education, Regional economy, Coordinated development, Education policy

1.Introduction

Hangzhou is a major city in China and a new first-tier city in the country. The city's GDP ranks among the top ten in the country. During some research on the city, specifically investigating the correlation between the number of schools and economic development in the city. According to the records of the Hangzhou government in China, there are 162 schools in the city's high school education system (including general high schools, vocational high schools, general secondary vocational schools, adult secondary vocational schools and technical schools). However, twelve years ago, in 2010, there were only 72 high schools in Hangzhou. Twelve years ago, the GDP of Hangzhou, Zhejiang Province, China was only 0.6 trillion yuan. However, in 2022, our city's GDP has reached a high of 1.88 trillion yuan.

Coordinated economic development is an inevitable trend of social development and a necessary guarantee for economic construction. The economy provides sufficient material guarantee for the development of higher education, and the two complement each other. Higher education has become one of the important factors of economic development. Higher education is a powerful promoter of national economic development; with the continuous development of modernization, the demand for knowledge for economic development has become increasingly obvious.

Higher education can measure a country's development level and potential, and technological innovation drives the deepening of a country's economy. Technological

progress is the core of economic growth. Technological innovation brings changes and development in all aspects of technology; Human capital can promote economic growth, and higher education cultivates talents and enhances the capital attributes of human resources, ensuring the quality of the labor force through the application and creation of knowledge. It is an important component, support and upgrade of technological innovation and industrial upgrading, and a key factor of economic growth. Therefore, progress in higher education must have long-term, stable economic impacts. At the same time, higher education, scientific and technological innovation, and economic and social development are interdependent and synergistic. The higher the level of higher education, the stronger the local scientific and technological innovation capabilities, and the stronger the economic strength; higher education and scientific and technological innovation are also limited by economic development level. There is an inseparable influence between these three. The point is that higher education is the foundation of scientific and technological innovation and the cradle of cultivating talents. It provides a platform to acquire knowledge and skills to advance technological innovation. Technological innovation is a major driver of economic growth because it can increase employment opportunities and attract domestic and foreign investment. Briefly, higher education should be the main development goal of contemporary society.

In terms of industrial transformation and upgrading, many developed countries are mainly committed to the advance-

ment of science and technology and the improvement of human capital to achieve the purpose of economic growth. They rely on technological progress to increase strength and vitality to upgrade industries. They are currently in a new era of technological development.

Higher education will bring about the accumulation of human capital and improve the quality of workers; technological innovation will lead to technological progress and high-quality economic development. Therefore, this article attempts to analyze higher education, technological innovation and economy under the same system framework, and analyzes the relationship between the two factors of higher education and technological innovation that affect the economy, and optimizes the allocation of educational resources, promotes the integration of science and education, and Discussions on promoting the development driven by scientific and technological innovation have certain reference significance for improving the overall competitiveness and sustainable growth of the national economy. The research conclusions will help to deepen the reform of higher education system and mechanism, scientific and technological innovation system and mechanism, and economic development and provide further support. In order to deepen the understanding of the importance of higher education, scientific and technological innovation and economic development, enhance the awareness of the integration of science and education, change the higher education system, the strategic direction of scientific and technological innovation, and the unreasonable and unbalanced situation of economic development, provide reference for relevant education policies , etc. It is helpful to explore the coordinated development direction of higher education, technological innovation and economy.

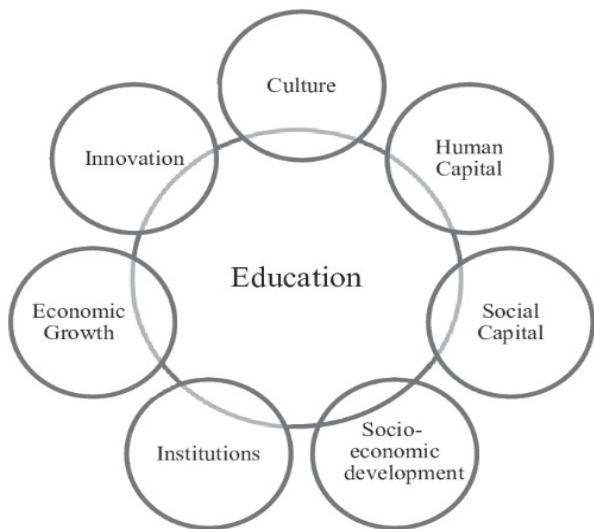


Fig1.The impact of education on economy

2.Literature Review

“Endogenous economic growth” means that the long-term economic growth is mainly determined by the internal driving force of the economy itself, such as endogenous technological changes and capital accumulation, and does not rely on external conditions of the economy, such as exogenous technological progress and capital. Only in this way can we better explain the growth problems that cannot be explained by relying on exogenous forces to promote and maintain long-term economic growth. In the mid-1980s, economists represented by Romer, Lucas and others divided modern economic growth (whether “endogenous” or “exogenous”) into factors such as endogenous savings rate and endogenous population growth. There are two endogenous progress models driven by capital or labor “factor input”, and technology-related “technological progress” driven by knowledge spillover, human capital accumulation, research and development, etc.

Schultz and Becker(1956) innovatively developed the Human capital theory and believed that differences in human capital were the cause of regional differences in economic growth. Human capital investment brings a longer reporting period than capital investment, so human capital investment has a greater impact on economic development. Human capital can be measured by human capital stock and quality, with the emphasis on quality. School education is the basis of educational investment and an important part of human capital investment. Among all resources, human capital is the most important and should be allocated according to market demand.

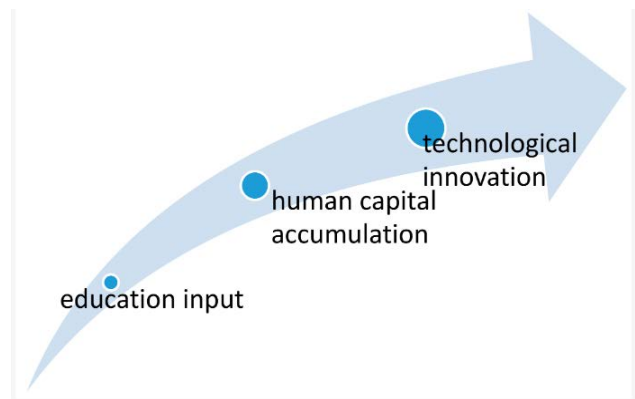


Fig2.The relationship between education input and technological innovation.

Powers and Kindis believed that the social function of education is the source of its economic value, which is the prototype of socialization theory. Thurlow, Dollinger and others made significant contributions to market segmentation theory. They argue that, under appropriate assumptions, education has a certain impact on wage levels. They

do not deny the role of education in the labor market. It complements and refines human capital theory by incorporating education, institutions, and employer attitudes toward work as endogenous variables that affect earnings. (Temple,1999)

2.1 The development status of higher education in China

School education in China has gone through thousands of years. In the Xia Dynasty in the 21st century BC, there were schools, and other educational institutions. After thousands of years of evolution, the first National Higher Education Conference was held in Beijing on May 16, 1950. The conference determined the policies and tasks of higher education in China, marking the starting point of higher education in China. Huang(2013) analyzed and evaluated the current situation of higher education in the Beijing-Tianjin-Hebei urban agglomeration and established evaluation indicators for higher education in each city. He found that there was an obvious trend of incoordination between higher education and economic development, with a low level of coordination and a lack of coordination between higher education development and economic development. The levels are positively correlated, and there is a large gap in the main measurement indicators. Finally, according to the law of development, it puts forward effective countermeasures and suggestions on how to adjust the coordinated development of higher education and regional economy. Tang Weibing et al.(2014) summarized the characteristics of the development stages of higher education, conducted a large number of analyzes of practical problems in higher education from the perspective of higher education management, summarized the development trends of various disciplines in higher education management activities, and proposed that the current level ratio of higher education is inconsistent. Reasonable, lack of features, poor connectivity and other issues. Li Miaomiao et al. (2015) also believes that the development trend of graduate education is gradually slowing down. The goals of educational structure analysis and adjustment are: to vigorously develop higher vocational education, improve the quality of undergraduate education, study changes, and at the same time have important practical significance for further promoting the popularization of cultural education. Wang Shuqiao et al. (2015) believes that adjusting and improving the analysis of higher education structure can not only promote the education concept of industrial structure, but also promote new development of higher education with the help of educational informatization, provide innovation for the overall development of higher education, interconnect universities, cities, and industries, and develop new higher

education Models and new functions, updating higher education requirements, forming new development concepts, creating new development methods, and rearranging the overall layout of higher education.

Wang and others(2006) found through research on higher education in Macao that although its higher education development level is growing rapidly, there are still problems such as the inability to retain local students, limited enrollment from outside, unreasonable course structure, and low overall teaching quality. You(2022) focused on the relationship between higher education and socio-economic and cultural development in Jiangsu Province, focusing on the development status and potential problems of Jiangsu Province's curriculum structure, education level, geographical distribution, and management model since the expansion of higher education enrollment. The research results show that Jiangsu Province's higher education policy can no longer fully adapt to the development of socio-economic culture and needs to make corresponding structural adjustments to ensure the sustained power of rapid socio-economic and cultural development. Li(2010) conducted a detailed analysis of the higher education planning of Xiongan New Area. Taking the contradiction between the advanced education model and relatively backward and closed local education resources as the starting point, and based on the big data of higher education, she conducted a detailed analysis of the higher education planning. analyze. Analysis shows that the current resident awareness and learning philosophy of local indigenous residents have not kept up with the needs of development. Facing the rapid transformation of regional economic development in Xiongan New Area, it is necessary to accelerate the pace of development of the local education system.

Through the above research, it can be concluded that higher education has the characteristics of regional unbalanced development, Course design, structure, etc, which leads to the issue of coordination between higher education and economic development.

2.2 The relationship between higher education and economic development

There are many studies on the relationship between higher education and economic development. Among them, American scholars' views are taken as an example. Their focus is more on two aspects.(Wang,2008): First, the output of higher education means the improvement of the labor force, which can directly enhance the regional economy of the region; the second is that the demand for higher education in a region can gradually improve the infrastructure of the region. In this regard, the research results of Isaacs in 2015 are representative, and its research

conclusions are important for subsequent scholars in this field research has had a profound impact. At present, since the formation of this ideology is based on the traditional economic model, only the direct impact of higher education can be considered. However, with the rapid changes in the law of economic development in the new era, higher education has a greater impact on the regional economy. deep indirect effects. This phenomenon has given birth to some new concepts, which believe that personnel training and technology research and development are the promotion methods that higher education has the most profound impact on regional economic development. This

kind of thinking was confirmed in Martin’s 2017 “new field of impact of higher education based on skilled labor on regional development”. He believes that higher education not only has a direct impact on regional economic development, but this impact should also include skilled labor trained through higher education. It can be seen that with the progress of the times, the structure of higher education is constantly being optimized, the law of economic development is also constantly evolving, and the research on the relationship between the two is also constantly being updated.

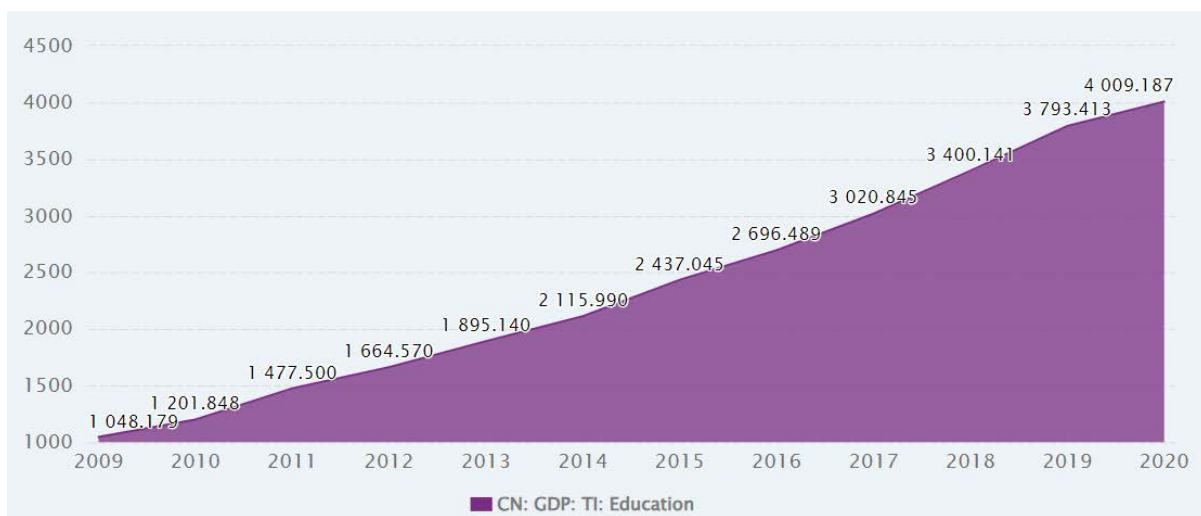


Fig3. China’s GDP & Education from 2009 to 2020

Education data was reported at 4,009.187 RMB bn in 2020. This records an increase from the previous number of 3,793.413 RMB bn for 2019. The data reached an all-time high of 4,009.187 RMB bn in 2020 and a record low of 489.256 RMB bn in 2009. From 2009 to 2020, China’s gdp growth and education expenditure maintain a stable positive growth relationship, maintaining a constant growth rate every year, which shows that the government attaches importance to education expenditure and education can bring positive effects on economic growth. (He,2020)

2.2.1 Higher education can provide sufficient human resources

Now is the era of the knowledge economy, the importance of knowledge is becoming more and more obvious. Knowledge resources have been developed into an important prerequisite for better economic development. The possession of talents has become the fundamental condition for the development of the country and society. (Luo,2010) Higher education provides abundant human resources for the development of regional economies. The development of a regional economy should depend on the

degree of development of various enterprises. Nowadays, it is difficult for enterprises to leave innovative ideas, and innovation requires sufficient talents. Therefore, the situation of enterprises’ introduction of talents is directly related to success or failure. At present, among the regional economies of China, the southeast is indeed the region with the best economic development situation in China. The colleges and universities in this area are relatively developed and there are many schools, so the overall quality of the population is relatively high, and the colleges and universities have cultivated a large number of outstanding talents for the area. According to statistics, the employment areas for talents with graduate degrees or above in my country mainly flow to developed coastal areas, big cities and areas where training schools are located. Therefore, the development of higher education is one of the important factors for the economic development of coastal areas, and higher education provides sufficient talent reserves for the development of the local economy. (Lu, 2009)

2.2.2 University infrastructure construction can stimulate regional economic development

The consumption of college students can play an important role in promoting the areas surrounding universities because it has a positive impact on local economic development. According to common sense, universities will be built in relatively remote areas. One is because it covers a large area, and the other is because remote areas are more suitable for learning because they are quieter. The most important thing is that it helps disperse educational resources and ensure that people in more areas have access to higher education opportunities. However, it can also boost economies in remote areas. Industrial development in remote areas is inseparable from economic development circles. Chen took country's Inner Mongolia as an example to conduct an in-depth analysis of the extent to which higher education affects economic development, listed the changes in per capita GDP from 2009 to 2019, and conducted a comparative analysis of Inner Mongolia's industrial structure and growth rate. Finally, it is concluded that higher education contributes to regional economic development.(Chen,2019)

Blankenau (2007) From the perspective of impact mechanisms, educational human capital is the basis for promoting regional development and an important indicator for evaluating a country's comprehensive strength. The continuous increase in the enrollment rate of higher education promotes the accumulation of human capital, thereby promoting rapid economic development. Therefore, the contribution rate of higher education to economic development can be increased by cultivating human capital. Qin and Wang (2017) believe that technological progress and technological innovation brought by human capital promote the progress of productivity, thus promoting high-quality economic development. The development of social economy, science and technology and comprehensive quality requires human capital. By increasing the cultivation of human capital, we can promote the optimization and upgrading of industrial structure, improve technological level, and ultimately achieve high-quality economic development. The construction of university infrastructure can effectively promote regional economic development, because the establishment of universities can create more employment opportunities. A well-established university requires a large number of teachers, managers, administrative staff and security personnel. So this can effectively drive community and economic development. Generally speaking, the number of students in universities is very high, and students' living expenses are also quite large. This is also likely to drive local economic development.

2.2.3 Universities are important bases for local high-tech development

Universities are important bases for local high-tech development and have rich learning resources. Through high-quality teaching and training, universities can cultivate various talents and provide support for high-tech industries. This can not only create a good cultural atmosphere, but also promote local economic development. For example, Zhongguancun in Beijing, China. It is China's first national high-tech industrial development zone. This science and technology park is the area with the most intensive scientific, educational, intellectual and human resources in my country, with nearly 41 institutions of higher learning, such as Tsinghua University and Peking University. It has 206 national scientific research institutes, such as the Chinese Academy of Sciences; 67 national key laboratories, 27 national engineering research centers, 28 national engineering technology research centers, etc. .

Zhu and Peng (2018) believe that higher education occupies a core position in the development of scientific research in my country. Only when the scientific research results of universities can provide high-quality services for the high-quality development of the regional economy, will the region actively carry out scientific research projects with universities, and local governments will invest in university scientific research projects. It will also promote the improvement of the scientific research level of universities, thereby better serving the high-quality development of the regional economy. Therefore, the transformation of scientific and technological achievements and the high-quality economic development are mutually reinforcing and complementary.

2.2.4 Higher education is conducive to promoting foreign exchanges

In foreign exchanges and cooperation, the opening of higher education to the outside world is also an important area, which has received widespread attention from all countries and is an indispensable link in international cooperation and exchanges. Strengthening international exchanges and cooperation in higher education can not only promote knowledge and technological innovation and promote common economic development, but also promote cultural exchanges and social progress. Zhao (2019) believe that the development of economic integration has also brought about the rise and development of higher education cooperation and exchanges between countries. At the same time, the development of Internet technology has enabled international educational resources to break the limitations of time and space and promote education to serve the development of various countries. economic behavior.

3.Discussion

3.1 Does the imbalance between education and economic development still exist?

According to relevant literature, previous scholars have done a lot of research on the development level of higher education and the level of economic development. At the same time, the positive correlation between the level of higher education and high-quality economic development has been confirmed many times, which provides a basis for further research on the two. laid the foundation for the relationship between them. However, there are still some literatures that point out the problems existing in the current educational development:

Zeng took Xishuangbanna as an example to demonstrate the coordinated relationship between higher education and regional economic development, and conducted an in-depth analysis of the determination of coordination indicators between higher education and economic development. He used variables of higher education and economic development to reasonably calculate various indicators to support this. Finally, it is concluded that the development of regional economy and higher education in Xishuangbanna is not coordinated and insufficient, and the rapid development of regional economy has not effectively promoted the development of higher education. To put it simply, the development of higher education in border areas has almost negligible services and contributions to the regional economy. This also shows that the previous assumption does not hold.(Zeng ,2021)

Qu (2018) believes that the imbalance in the spatial distribution of higher education resources has brought about inequality in educational opportunities between regions. Although preferential policies to vigorously develop higher education in the central and western regions are continuously promoted, objectively speaking, the eastern region is rich in educational resources. , and development is more balanced and educational equity is higher, making higher education in the region more significant in promoting economic development. But in the long run, education and economic development are coordinated and present a good development trend.

When it comes to education promoting socio-economic development, here is a good example. A study released by the Jackson, Tennessee, USA Youth Association shows that in the fiscal year ending June 30, 2020, Coombsville University had the highest scores on its main campus and its Louisville, Harrodsburg and Somerset campuses. Ranked highest on campus. Total economic benefits generated by related education businesses and operations in the region were \$295,607,604. According to Interim President Dr. H. Keith Spears, in addition to the main education-related business of Coombswell University's main

campus and its Louisville, Harrodsburg and Somerset areas, students' daily living expenses, visiting people from all over the world Tourists etc. will also be affected. It is also a considerable source of income. This is a very large amount of money. It not only proves the development of the local economy, but also reflects the long-term benefits that higher education brings to social and economic development. Through the dissemination and promotion of higher education, universities have not only become an effective way for ordinary people to seek scarce higher education resources, but also become an economic engine that promotes local social development. However, since regional economic development changes vary widely, this also reflects relative disharmony. This is detrimental to the long-term development of society, and it cannot show a good development trend.(Bouchakour,2019)

3.2 Some measures maybe can solve the current problems

Nowadays, facing the problems of balanced development of education and economy, the core conditions of higher education should be consolidated and the role of higher education in promoting high-quality economic development should be strengthened in areas where higher education can support high-quality regional economic development. For the areas where higher education fails to support regional economic development, the lack of core conditions should be reversed and the supporting role of higher education should be brought into play. Therefore, this paper puts forward four suggestions:

3.2.1 Strengthen the transformation of educational scientific and technological achievements

At present, the formalism of scientific research in colleges and universities still exists, which decouples the scientific research achievements from the actual needs, causes scientific research waste, and hinders the innovation and development of colleges and universities. Therefore, in order to fundamentally reverse the difficult situation of the transformation of scientific and technological achievements, first of all, it is necessary to change the thinking of scientific research construction in colleges and universities and innovate the assessment system. Secondly, it is necessary to take the market demand as the guidance, so that the market demand becomes the direction of scientific research development, so that the scientific research results can be truly put into practice, so that the scientific research construction of colleges and universities is no longer superficial, but in-depth reality, cultivating talents needed by the country and society, so as to help the scientific research results better serve the society. Finally, the government should ensure the smooth transformation

of science and technology achievements, aiming at the status quo of unbalanced regional development of transformation of science and technology achievements in our country. The central and eastern colleges and universities with relatively complete markets and concentrated high-tech industries will be encouraged to change their thinking and methods, guide them to become market-oriented, and the government will support them. On the other hand, the funds for the western region should be strengthened. Investment to ensure the vitality of innovation, while guiding scientific research and innovation needs of large enterprises to carry out cooperation with western universities.

3.2.2 Strengthen educational cooperation and international exchanges

Higher education is an important window for our country to carry out international exchange and cooperation, and a cluster of high-tech talents. To strengthen international cooperation, first of all, it is necessary to establish a Sino-foreign exchange and cooperation mechanism, make use of big data, the Internet and other technologies, innovate international exchange models, and introduce high-quality foreign resources to carry out exchanges and cooperation. Encourage university teachers and students to participate in international academic exchanges and cooperation, and cultivate their scientific research and innovation ability. (Yuan, 2019)

Encourage students from overseas universities to study in China, optimize the educational hierarchy of international students, and ensure and improve the quality of international students. Second, build a platform for exchange and cooperation, broaden communication channels, strengthen cross-border exchange and cooperation of scientific research achievements, focus on modern digital technology, realize resource integration, and carry out forward-looking and strategic research. Finally, international exchanges and cooperation in higher education should not only be limited to some famous universities, but also focus on the development of vocational education and carry out international exchanges and cooperation in vocational education.

3.2.3 Increase educational opportunities and promote social equity

The realization of educational equity is an important way to promote social equity, and the imbalance of higher education development is obvious at present. Equalization of educational opportunities is an ideal goal to achieve educational equity, and the government plays a leading role in resource allocation. To solve the problem of uncoordinated development of educational opportunities, the government needs to ensure the reasonable allocation

of educational resources, provide adequate educational infrastructure and services, and create an environment of equal educational opportunities. Under the condition of limited educational resources, it is necessary to change the situation of only focusing on key colleges and universities and ignoring ordinary colleges and universities in the past. It is necessary to shift attention to the backward regions in the central and western regions with relatively lack of educational opportunities, pay attention to rational allocation of resources, realize effective utilization of existing resources while introducing high-quality resources, promote rational flow of educational resources, and increase investment in educational resources in this region. Create conditions for local higher education equalization, narrow the inter-provincial gap, and alleviate the imbalance in the development of higher education.

3.2.4 The government and relevant departments should increase investment in education

At present, China's overall higher education has entered the popularization stage, and the rationalization of educational investment and structure is the key content. In the composition of China's education investment, the proportion of social funds other than financial funds allocated by the government is very small. (Qi, 2022) In order to further promote the popularization of higher education in an all-round way, diversified financing channels of education funds should be explored, financial funds and non-financial funds should jointly promote the development of education, steadily increase the proportion of financial investment, and significantly increase the proportion of social investment. In addition, project research is carried out in cooperation with the local government to solve the funding problem and improve the quality of talents in colleges and universities. In addition to increasing education funds and broadening the channels of education funds, it is particularly important to actively optimize the management of higher education funds and improve the utilization rate of higher education funds.

4. Conclusion

In general, this article studies the relationship between higher education and economic development through literature analysis and case summary research methods. We can draw several important conclusions:

1. China's school education has gone through thousands of years of history. Schools and other educational institutions have existed since the Xia Dynasty in the 21st century BC. After a long evolution, China held its first national higher education conference in Beijing on May 16, 1950, which determined the policies and tasks of higher education in China, marking the starting point of higher education in

China. Research in recent years has shown that China's higher education development is characterized by regional imbalances, including curriculum design, structure and other issues, which leads to difficulties in the coordination between higher education and economic development.

2. There is a positive mutual influence between higher education and economic development. Higher education is not only the result of economic development but also its driving force. Education provides high-quality talents, promotes technological innovation and the development of knowledge industries, and in turn promotes economic growth. Secondly, higher education needs to adapt to the needs of economic development. The development direction of higher education should be consistent with economic structural adjustment and industrial upgrading to meet society's needs for all types of talents.

3. Higher education needs to do a better job of boosting the economy. In addition to imparting knowledge and cultivating talents, higher education should also actively participate in industrial cooperation and scientific research projects to promote the transformation and application of scientific and technological achievements. Finally, governments, educational institutions and industry need to strengthen cooperation to jointly promote the positive interaction between higher education and economic development. The government should formulate relevant policies and provide support and guidance, educational institutions should continuously optimize the education system and curriculum, and the industry should actively participate in talent training and scientific research cooperation to jointly promote the common progress of higher education and the economy.

Overall, through these efforts, we can achieve a win-win situation between higher education and economic development and promote social prosperity and progress.

5. Review

After reading a lot of relevant literature and writing these thousands of words, I finally came to a relatively reasonable result. Higher education and economic development are closely related, and they have a mutually reinforcing relationship. I have divided this article into three levels. The first is to conceive the framework, the second is to write, and the third is to review, reflect, revise and improve my thesis. These three stages are all extremely important. It is like building a house. You cannot build a tall building without a good foundation which means there is no perfect paper without a perfect framework. The writing of this paper brought me great gains. I learned how to use existing knowledge to make a reasonable mind map to expand them. I make knowledge more flexible and easier

to understand. I also gained new insights into writing, and my sentences became more diverse. After a series of revisions, this article met my expectations. But after reflection, I also discovered some of my own problems. I am still a pupil, and the amount of knowledge I have now is far from enough. I need to spend more time expanding my knowledge.

But my paper also has some limitations. For example, this paper mainly uses the methods of case analysis and literature summary to draw conclusions, and the relevant data and analysis are less, so the conclusion may not be sufficient and comprehensive. Secondly, the scope of this study is mainly focused on China, and there are few cases in related countries. In the future, more data and more abundant data analysis methods can be added to draw more profound and extensive conclusions. And in the further study, to enhance the accuracy and comprehensiveness of future research, a greater emphasis on the latest data and information, expansion of research depth and breadth, diversification and representativeness in sample selection, and careful consideration of uncertainties in future developments are recommended.

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