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Article

How Can Colleges Promote the Integration of Industry and Education in Economically Underdeveloped Areas

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Abstract: This paper discusses how to effectively promote the integration of production and education in colleges in economically underdeveloped areas in order to promote the coordinated development of education and industry. Faced with the challenges such as small scale of enterprises, weak integration willingness and insufficient adaptability of colleges and universities, this paper puts forward the countermeasures of building a community of interests. First, it emphasizes the policy level. The government needs to increase investment and incentives, provide financial support, optimize the policy environment, and promote the participation of enterprises. Second, to guide industrial transformation, clear direction, education chain matching and upgrading, to meet economic needs; Thirdly, colleges and universities need to improve their connotation, docking industries, strengthening scientific research services, and adapting to the needs of transformation. Finally, share interests, build mechanisms, strengthen cooperation, and ensure the motivation for participation. Through these strategies, the integration of industry and education in less developed areas will form a win-win ecology, promote the interaction between colleges and industries, promote economic transformation, and provide solid support for rural revitalization and education quality improvement to achieve high-quality development.

Keywords: less-developed areas; colleges; integration of production and education; community construction

1. Introduction

With the rapid development of the global knowledge economy, the deep integration of education and industry has become a key engine to promote regional economic growth and social progress. Especially in the less developed areas, this model has shown its unique urgency and strategic importance. The integration of industry and education, as a new form of cooperation between education and industry, aims not only to break traditional boundaries, but also to build a seamless bridge between the education chain, the talent chain, the industrial chain and the innovation chain, so as to promote the optimal allocation of resources and maximize efficiency. In 2019, the "National Vocational Education Reform Implementation Plan" issued by the Chinese government emphasized the necessity for enterprises to participate in vocational education and advocated the symbiosis between education and industry enterprises. In the same year, the "High-level vocational Colleges and professional Construction Plan" clearly pointed out that vocational colleges and industries form a community of destiny, providing impetus for the construction of modern industrial system and competitiveness. This shows that building a community of integration of industry and education is a new idea at the national level to deepen education reform, respond to the needs of the new era, and innovate the education model, which has far-reaching significance for solving the practical dilemma and deepening the integration of industry and education.

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2. Why Promote the Integration of Production and Education in Colleges in Less Developed Areas

In China, the research on the integration of industry and education is in a vigorous stage. Up to now, there are more than 1,800 relevant research papers found on CNKI, the earliest of which is the Research on the Community Construction of Integration of Industry and Education in colleges published by Professor Lin Yan in Vocational and Education in July 2002. So far, relevant researches around the world have given a unified definition of "industry-education integration", that is, it is a multi-dimensional and cross-field education development strategy, the core of which is to promote the deep cooperation and integration between the education system and the industry. In the academic field, the definition of the integration of industry and education can be summarized as follows: the integration of industry and education refers to the close cooperation between education and industry to achieve the effective docking of educational resources and industrial needs, so as to cultivate high-quality talents who meet the needs of modern industrial development. This integration strategy emphasizes the synchronous updating of educational content and industrial practice, the close combination of teaching methods and work scenarios, and the direct correspondence between educational results and enterprise needs. The integration of industry and education not only involves the internal reform of education such as curriculum setting, teaching mode and teacher team construction, but also includes the establishment of external cooperation mechanisms such as technology research and development cooperation with industry, construction of internship and training bases, and student employment guidance. Its ultimate goal is to build a dynamic and sustainable education ecosystem that can adapt to the rapidly changing socio-economic environment and promote knowledge innovation, technological progress and industrial upgrading.

In today's social background, although every country has first-tier cities with rapid development, more cities are still in the early stage of development, and more schools and students are still studying and living in economically underdeveloped cities. It is of great practical significance to promote the integration of industry and education in colleges in underdeveloped areas.

2.1. The Needs of Self-Construction and Development of Colleges

In economically underdeveloped areas, colleges to promote the integration of production and education is a key strategy to achieve their own sustainable development. This kind of integration mode can bring many benefits to colleges and universities.

First, under the current background of economic globalization and informatization, industrial upgrading and technological change are speeding up day by day. Through the integration of production and education and close cooperation with local enterprises, colleges must timely adjust educational content and methods to ensure that teaching is synchronized with market demand, so as to improve the practicality and pertinence of education and cultivate high-quality technical talents with innovative spirit and ability. In order to meet the new requirements of social development.

Second, enterprises provide schools with internship training opportunities. However, as a teaching and scientific research institution, the annual state funding is limited, which makes it impossible for the school to buy too much hardware equipment for students. For example, the relevant instruments required by students majoring in medical laboratory require tens of millions or even hundreds of millions of yuan. In addition to the hardware equipment, the school cannot provide a complete production link and the real production environment, for example, medical and health care students, in the school lack of patients, the corresponding medical tools and so on. As a real and direct solution to social problems, enterprises have these conditions.

Third, in economically underdeveloped areas, colleges often face difficulties such as insufficient funds, backward facilities and lack of teachers with practical experience. The

integration of industry and education provides an effective way to solve these problems. Through cooperation with enterprises, colleges and universities can obtain corresponding support, improve the conditions of running schools and enhance the quality of education. For example, professional technicians and managers in enterprises can participate in teaching and scientific research as part-time teachers or visiting professors. Their rich practical experience and industry insight can bring valuable inspiration and guidance to students.

Fourth, local enterprises are often the main carriers of employment for local graduates. Developing the integration of industry and education not only provides students with practical training opportunities in school, but also provides a good start for students to enter these enterprises in the future. At present, the number of graduates in China each year is far greater than the number of job opportunities in the market, resulting in a severe employment situation. One of the most important goals for schools to train students is the employment rate of students. To strengthen the integration of industry and education, relevant enterprises will give priority to students from cooperative universities, help them find jobs and ease the employment pressure.

2.2. Helping Rural Revitalization

When discussing the importance of building an integrated community of production and education in colleges in less developed areas, its importance in helping rural revitalization cannot be ignored. The implementation and promotion of the integration of industry and education have injected new impetus and vitality into the rural revitalization in the less developed areas.

First, the integration of industry and education community provides solid talent support for rural revitalization. Talents with bachelor's and master's degrees often choose to work in developed regions, advanced and sophisticated industries, and China's top 500 enterprises, so less-developed regions are often faced with a shortage of talents. On the one hand, students in vocational colleges have practical learning in school. At the same time, they are more acceptable to work in small and medium-sized cities and have lower job hunting goals. Therefore, students in vocational colleges have become the main force of talents in underdeveloped areas. These talents will become the backbone of rural revitalization and promote the sustainable development of rural economy.

Second, the integration of industry and education has promoted the transformation and upgrading of rural industries. Through cooperation with enterprises, colleges can deeply understand the development status and future trend of rural industries, and provide services such as technical consultation and product development for rural industries. At the same time, the scientific research teams of colleges and universities can also solve the bottleneck problems of rural industries, carry out scientific and technological research and transformation of results, promote the innovation and upgrading of rural industries, and enhance the competitiveness of rural economy and the ability of sustainable development.

Third, the integration of industry and education helps to enhance the soft power of rural culture. In the process of cooperation with enterprises, colleges not only pass on advanced scientific and technological knowledge and management ideas, but also bring rich cultural resources and innovative thinking. The combination of these resources and thinking with rural culture can stimulate the innovative vitality of the countryside, enhance the soft power and attractiveness of rural culture, and promote the overall revitalization of the countryside.

2.3. The Needs of Local Enterprises and Regional Economy

The reason why this paper chooses the underdeveloped area as the research object is that it has the effect of urgency and popularization. In China and the world, the developed

regions are significantly less than the less developed regions, and the economically developed regions have complete industrial chains, talent accumulation, high research and development level, close cooperation between industry and academia, and good economic development momentum. It is not necessary to implement the integration of industry and education to a large extent. However, the less developed areas urgently need to seek economic development by all means, and the integration of industry and education is a good way to solve this problem.

In terms of the quantity of talent recruitment: Recruitment has always been a difficult problem for enterprises in less developed areas. People with higher degrees usually have more choices in the job market, and big cities attract them because they offer more job diversity, pay and opportunities for career advancement. Economically developed areas have high quality of life, such as infrastructure, educational resources, medical conditions and cultural activities, which are more important to highly educated people. Large cities gather many industry leaders, and highly educated talents pursue communication and cooperation opportunities with industry leaders, which is conducive to their career development. Therefore, highly educated talents often do not return to work in less developed areas. However, students in vocational colleges pay more attention to other aspects when finding jobs. Employment-oriented: Vocational school education pays more attention to skill training, and the curriculum is closely connected with actual work needs, so students are more inclined to find jobs where they can directly apply their skills. Economically underdeveloped areas may provide more such opportunities. Regional affinity: Many vocational school students may come from local or surrounding areas. They have deep emotional connection to their hometown and are willing to return to work and contribute to the development of their hometown.

In terms of the quality of talent recruitment: Through the integration of industry and education, enterprises can cooperate with vocational colleges, customize talent training plans according to the actual needs of enterprises, and ensure that graduates have the professional skills and knowledge required by enterprises, so as to reduce the time and cost of employee training. This is also the employment advantage of colleges with local characteristics.

Research and development technology and production experience: these economically underdeveloped areas usually face the problems of brain drain, backward technology and single industrial structure, and these enterprises are often unable to independently set up research and development departments, and the integration of industry and education can provide an effective way to solve these problems. Through close cooperation with colleges, enterprises can purchase some advanced industrial technology from the schools, so as to enhance the innovation ability and market competitiveness of enterprises. For example, the teachers of Anhui Forestry Vocational and Technical College provide a lot of professional technical support for the forestry, wood, grain production and other related industries in Anhui. Although undergraduate colleges will also participate in the integration of production and education, their research fields are usually more preface and high-end, such as quantum physics, artificial intelligence, and so on, and undergraduate colleges are more inclined to cooperate with leading and Internet enterprises, rather than research agricultural production, child care and other traditional enterprises, small enterprises cooperation.

3. Difficulties Faced by the Integration of Industry and Education

When discussing the actual situation and challenges of the integration of industry and education in colleges in less developed areas, this study focuses on the national demonstration colleges, provincial quality colleges and regular colleges in Anhui Province, and selects representative cases for in-depth investigation (Wuhu Vocational and Technical College, Huishang College, Hefei Binhu College). Based on the policy docu-

ments such as the Guiding Opinions on Deepening the integration of Industry and Education and the Action Plan for Deepening the Reform of Vocational Education, we carefully planned the contents of the research, focusing on the analysis of the breadth, depth and effectiveness of the integration of industry and education, and explored the various factors affecting these dimensions. Through systematic analysis of the survey data and interview data, we revealed the main problems and bottlenecks encountered by vocational colleges in less developed regions in Anhui province in the process of promoting the integration of industry and education.

3.1. Objective Conditions: The Number of Large Enterprises in the Region Is Small

Anhui is an important province in China. Like other provinces, enterprises are the cornerstone of the development of higher vocational education and provide important support for the integration of production and education in colleges.

According to the statistical data on the number of industrial enterprises above designated size in various provinces in China by the end of 2021, there are 19,940 industrial enterprises above designated size in Anhui. Although the number is higher than that in Xinjiang and other provinces, there is still a significant gap compared with 58,763 in Guangdong Province, 51,323 in Jiangsu Province and 49,177 in Zhejiang Province. At the same time, according to the list of China's Top 500 Enterprises in 2022 released by China Enterprise Confederation, Anhui only has 8 enterprises shortlisted, which is still relatively small compared with 70 enterprises in Guangdong Province, 44 in Jiangsu Province and 46 in Zhejiang Province. This reality makes colleges in Anhui face challenges in the integration of industry and education, as there is a lack of sufficient industrial "fertile soil" to support the widespread implementation of the integration.

According to the survey data, the three colleges have only 6.2, 4.3 and 4.1 cooperative enterprises per major respectively. By the end of 2022, the number of China's top 500 or industry leader enterprises that have established cooperative relations with the three colleges in Anhui is 5, 3 and 3 respectively, which is also low. This is also one of the important factors that make it difficult for colleges in less developed areas to timely transform high-end industries and advanced technologies of high-end industries into teaching resources.

3. 2. Enterprises: Lack of Willingness

The survey results show that among the three colleges, only one national "double-high" college has established a national skill master studio, and only two provincial and ministerial skill master studios have one each. It can be seen that the proportion of high-end human resources invested by enterprises in Anhui province under the "dual-main" education model is low; In addition, among the three colleges surveyed, there is no case of co-building industrial colleges in the form of shareholding, and the proportion of equipment investment provided by enterprises to cooperative colleges is also low. By the end of 2021, the proportion of enterprise investment equipment in the three colleges is 1.2% on average, and most of them are obsolete old equipment, indicating that the fixed asset resources invested by enterprises in higher vocational education are relatively limited. Enterprises show a low willingness to participate in the process of promoting the integration of industry and education, which is usually caused by a variety of factors.

First, for cost-effectiveness reasons, companies may worry that participating in the integration of industry and education will increase operational costs, such as the construction of training bases, the provision of internship positions, and management costs. Second, the lack of policy support and incentives from the government may dampen enterprises' motivation, as they need clear policy directions and potential economic incentives to balance the additional input. Finally, often companies focus more on short-term benefits and fail to see the long-term returns from the integration of industry and education. It is obvious that the integration of industry and education is a long-term investment.

In order to stimulate the willingness of enterprises to participate, the government needs to provide clear policy support, establish a mechanism of mutual trust and long-term cooperation between educational institutions and enterprises, and enterprises need to recognize the long-term value of integration in promoting technological innovation, talent cultivation and sustainable development of enterprises. Through these measures, the concerns of enterprises can be reduced and their motivation to participate in the integration of industry and education can be enhanced.

3.3. Colleges: the Ability to Transform Education into Industry Is Not Strong

Transforming education into industry refers to how higher vocational education can effectively integrate into and serve the local industrial development, that is, according to the needs of industrial transformation and upgrading, constantly improve the ability of colleges to serve the industrial development, and realize the leading and strengthening role of education in the industry. However, the current colleges in Anhui are generally facing the problem of insufficient ability to help regional industrial transformation and upgrading.

First, in the teaching resources. These institutions generally lack the advanced facilities and equipment needed to support the training of high-quality technical talents. For example, in 2022, the average equipment value of the three institutions is 28,000 yuan, 2.1 yuan and 17,000 yuan respectively, which is much lower than similar institutions in developed regions. Moreover, these devices often fail to keep up with the latest technological development trends in the industry, resulting in inadequate training of students' practical and innovative abilities. For example, students majoring in film and television production at Wuhu Polytechnic are still using older models of cameras and editing software, while industry standards have been upgraded to 4K or 8K resolutions and more advanced non-linear editing systems. Students majoring in architectural engineering at Binhu University in Hefei are graduating without exposure to building information modeling (BIM) software, which is standard in modern building design and construction management.

Second, the number and types of training bases are relatively limited and the technical content is not high. The average number of off-campus training bases for each major in these colleges and universities is 5.4, 5.1 and 4.2, respectively, and most of them fail to reach the frontier level of the industry, which limits the improvement of students' practical ability to a certain extent. For example, the Department of Electronic Engineering in Wuhu Vocational and Technical College has only one comprehensive training room, which needs to meet the needs of multiple practical training courses such as electronic circuit design, microcontroller programming and PCB plate making. Due to the limited space and equipment of the training room, students often need to wait in line to use the equipment, which limits their opportunities for practical operation and affects the effect of practical training. Take the e-commerce major of Hui Vocational College of Commerce as an example, in fact, the training base is mainly set up around traditional business negotiation and market analysis, and there is a lack of practical training programs for digital marketing, search engine optimization (SEO), social media marketing and other modern e-commerce fields. After completing their studies, students may feel overwhelmed when faced with digital marketing challenges in the real world of work.

Third, teachers' scientific research ability and social service ability also need to be strengthened. In the past three years, none of the three institutions surveyed has obtained provincial and ministerial science and technology projects, and only 14, 8 and 7 enterprises have participated in horizontal research projects respectively, and only 23, 16 and 5 national invention patents have been obtained respectively In 2022, for example, the technical service amount of the three institutions is only 230.38 million yuan, 697,800 yuan and 432,200 yuan, which can reflect the lack of their social service ability.

4. Countermeasures and Suggestions for the Construction of Production-Education Integration Community in Colleges in Underdeveloped Areas

After clarifying the urgency of promoting the integration of industry and education in colleges in less developed areas and the difficulties they face, we turn to the specific strategy level -- how to transform the theoretical framework into a practical path, promote the deep interaction between colleges and industry in less developed areas, and promote the synchronous development of education and economy. Next, we will deeply discuss from the perspective of government, enterprises, vocational colleges and other subjects to discuss how to concretely put the strategy of integration of industry and education into practice, to achieve effective interaction between vocational colleges and industry in underdeveloped areas, and promote economic development.

4.1. Increase Policy Support for the Integration of Industry and Education in Less Developed Areas

To promote the integration of industry and education in less developed areas, in particular, the government needs to provide policy support and promotion. Increasing policy support cannot only effectively make up for the shortage of resources, talents and technology in these areas, but also provide a strong institutional guarantee and incentive mechanism for the integration of industry and education.

First, the government should formulate more detailed and specific policies on the integration of industry and education to ensure that the policies can cover all aspects and levels of the integration. The policy contents should cover many aspects, such as financial support, tax incentives, talent introduction and training, industry-university-research cooperation, and innovation platform construction, so as to form a comprehensive policy system supporting the integration of industry and education. At the same time, policies should be forward-looking and flexible to adapt to the changing development needs of economically underdeveloped regions.

Second, the government should increase financial input to provide adequate financial support for the integration of industry and education. For example, a special fund can be set up to support the integration of production and education in colleges in economically underdeveloped areas, including the construction of practical training bases, the purchase of teaching equipment, and the introduction and training of talents. In addition, the government can also provide preferential loans, tax relief and other policy measures to reduce the cost and risk of enterprises and schools participating in the integration of industry and education, and stimulate their enthusiasm for participation.

Third, the government should establish an incentive mechanism to recognize and reward enterprises and schools that have made outstanding contributions to the integration of industry and education. This will not only increase the enthusiasm and initiative of enterprises and schools to participate in the integration of industry and education, but also form a good demonstration effect and promote more resources to be invested in the field of integration of industry and education. The government can also set up a platform to display the achievements of the integration of industry and education, showcase successful cases and excellent experience, and provide reference for other regions and units.

4. 2. Changing the Mode of Enterprise Development and Expanding the Demand for the Integration of Industry and Education in Enterprises

In less developed areas, the mode of industrial development is often more traditional and lacks the impetus for innovation, which not only limits the rapid growth of the local economy, but also restricts the development of the integration of industry and education in higher vocational schools. Therefore, changing the development mode of enterprises and enhancing the demand degree of the integration of production and education have become an important countermeasure to promote the integration of production and education in colleges in less developed areas.

5. Define the New Direction of Industrial Development

Industrial development in economically underdeveloped areas is often constrained by traditional thinking, resource constraints and technological bottlenecks, resulting in outdated industrial development models that are difficult to adapt to the needs of modern economic development. In order to break this situation, we must first clarify the new direction of industrial development to lead the new demand for the integration of industry and education.

Specifically, economically underdeveloped areas should conduct in-depth research on market trends, understand the development dynamics of advanced industries at home and abroad, combine their own resource advantages and industrial base, and choose industries with development potential and in line with local actual conditions as the development direction. For example, modern agriculture and agricultural product processing industry can be developed by relying on local characteristic agricultural resources; Or take advantage of local rich natural resources to develop eco-tourism and green energy industries.

On the basis of clarifying the new direction of industrial development, the government and enterprises should jointly promote the deep integration of industry and education. By formulating relevant policies, the government can guide colleges and research institutions to pay attention to the needs of industrial development, strengthen cooperation with enterprises, and jointly carry out technology research and development and personnel training. At the same time, enterprises should also actively participate in the talent training process of colleges and universities, provide internship and practical training positions and employment opportunities, and provide support for the career development of college students.

Through such deep integration, it cannot only provide a steady stream of talents and technical support for industrial development, but also promote the mutual benefit and win-win situation between universities and enterprises, forming a virtuous circle. At the same time, with the development and upgrading of the industry, the demand for high-quality talents will also continue to increase, thus further promoting the development of the integration of industry and education.

6. Optimize the Industrial Layout and Build an Ecosystem of Integration of Industry and Education

On the basis of clarifying the new direction of industrial development, economically underdeveloped areas need to further optimize the industrial layout and build an ecosystem integrating industry and education.

First, strengthen the construction of industrial parks. By building industrial parks, resources such as enterprises, universities and scientific research institutions can be gathered to form an innovation system that integrates production, learning and research. In the industrial parks, enterprises can enjoy preferential policies and convenient services, while universities and scientific research institutions can provide technical support and personnel training for enterprises. At present, the industrial parks that have been put into operation in Anhui province include Jinniu Lake Industry and Education Integration Park, Zhongan Joint City Industry and education Consortium, Guichi Vocational College nesting Park and so on.

Second, the link between the upstream and downstream of the industrial chain should be promoted. Less developed areas often have incomplete industrial chains and lack of effective links between upstream and downstream enterprises. To solve this problem, the government can strengthen inter-regional cooperation and promote cooperation and exchanges between upstream and downstream enterprises in the industrial chain. At the same time, an industrial chain collaboration platform can also be established to facilitate cooperation between upstream and downstream enterprises.

Third, we will build an ecosystem integrating industry and education. In the process of optimizing industrial distribution, we should focus on building an ecosystem that integrates production and education. We should strengthen cooperation and exchanges among universities, enterprises and scientific research institutions to form a sound situation of resource sharing and complementary advantages. Within this ecosystem, colleges and universities can provide technical support and personnel training for enterprises; Enterprises can provide practice base and employment opportunities for colleges and universities. And research institutions can provide the latest research results and technical support. This virtuous ecological circle will strongly promote the development of the integration of industry and education.

7. Education, Research and Innovation

In the process of promoting the integration of production and education in colleges in less developed areas, education and scientific research innovation play a crucial role, because the fundamental essence of the integration of production and education is to convert the scientific research technology of the school into the productivity of the enterprise.

First, deepen curriculum reform and textbook construction. In order to ensure that the teaching content of colleges is closely connected with the needs of industrial development, we need to carry out in-depth reform and optimization of the existing curriculum system. It is necessary to pay close attention to the development trend of regional industries, especially the development trends of emerging industries and key industries, and timely adjust the professional structure and curriculum to meet the needs of local enterprises for corresponding talents. For example, in view of the booming agriculture and seed industry in the region, related majors and courses can be added to meet the industry's demand for high-quality talents.

At the same time, the construction of teaching materials is also an important part of curriculum reform. We should encourage teachers to actively participate in the compilation and revision of teaching materials, and develop targeted and practical teaching materials in light of the actual development of the industry. In the process of compiling textbooks, enterprise cases and practical experience can be introduced to enable students to better understand the cutting-edge trends of the industry and the development trend of technology. In addition, they can cooperate with enterprises to jointly develop teaching materials to ensure that the content of teaching materials is highly compatible with the needs of the industry.

Second, we should strengthen the construction of research and innovation platforms. Scientific research innovation platform is an important carrier to promote the improvement of scientific research ability in colleges. In order to strengthen the construction of scientific research innovation platform, we need to establish long-term and stable cooperative relations with enterprises and scientific research institutions, and jointly invest in the construction of scientific research innovation platform. These platforms can conduct research on industries with regional characteristics and strategic emerging industries, and promote the transformation and application of scientific research results. In the process of building the platforms, we should actively introduce advanced scientific research equipment, technology and talents from home and abroad to enhance the scientific research capability and level of the platforms. At the same time, we should improve the incentive mechanism for scientific research and encourage teachers and students to actively participate in scientific research activities. For example, we can set up a research and innovation fund to provide financial support for research projects. Various scientific research competitions and academic exchange activities can also be held to provide a platform for teachers and students to show and communicate.

8. Building a Community of Shared Interests

In the process of building an integrated community of production and education in colleges in less developed areas, strengthening the construction of a community of interests is the core strategy to achieve in-depth cooperation between schools and enterprises. Building a community of interests requires both schools and enterprises to clarify their respective interests and development goals through in-depth dialogue and consultation on the basis of equality and mutual benefit. On this basis, the two sides can jointly formulate a cooperation plan and clarify the contents, methods, responsibilities and benefit distribution of cooperation, so as to ensure the fairness and sustainability of cooperation.

First, in-depth exploration of benefit-sharing mechanism design. When establishing a benefit-sharing mechanism, careful consideration should be given to the value creation and distribution at each stage of cooperation to ensure fairness, incentive and sustainability of the mechanism. First, clearly define the ownership of the fruits of cooperation, such as intellectual property rights and technology patents, which can be jointly held or divided according to the proportion of contributions. Secondly, a revenue distribution model should be set up to take into account the characteristics of different stages of cooperation. For example, the research and development can focus on government subsidies and enterprise input in the early stage, and the profits will be distributed according to the agreed proportion after the success of marketization in the later stage. In addition, flexible incentive plans should be implemented, such as setting up an "innovation reward fund" to give material and spiritual rewards to teams or individuals who have made significant contributions to stimulate innovation vitality. At the same time, diversified funding sources such as alumni funds and corporate donations should be established to provide financial guarantee for long-term cooperation.

Second, the detailed construction of the risk-sharing framework. To build a risk-sharing framework, we should take into account the types and levels of risks in the whole cycle of cooperation, and design a multi-level and multi-dimensional risk-sharing mechanism. First of all, insurance mechanisms, such as insurance for cooperative projects and insurance for the transformation of technological achievements, should be used to transfer some unforeseen risks. Second, the government and industry associations can play an important role in providing policy-based risk protection, such as credit guarantees and loss compensation, to reduce enterprises' concerns about participating in the integration of industry and education. In addition, risk early warning and emergency response mechanisms should be established to identify potential risks and take countermeasures in a timely manner through regular risk assessment and information sharing. The division of risk responsibilities should be clearly defined in contracts to protect the rights and interests of all parties and increase the stability and resilience of cooperation.

Third, the in-depth formulation of long-term cooperation agreements. The formulation of long-term cooperation agreements should go beyond the simple expression of cooperation intentions, and be transformed into detailed planning covering cooperation objectives, implementation paths, responsibilities and obligations, evaluation mechanisms, adjustment and exit mechanisms. First, the long-term vision and goals of the two sides should be clearly defined to ensure that the direction of cooperation is in line with regional development and industrial trends. Second, set milestones and specify specific tasks, expected results and assessment criteria for each stage. At the same time, a dynamic adjustment mechanism should be established to adjust the content and mode of cooperation according to the progress of cooperation and changes in the external environment. The agreement should also include a dispute settlement clause to ensure clear procedures for handling disputes in the course of cooperation and maintain the harmony and stability of bilateral cooperation.

Fourth, innovative practice of flexible cooperation models. In less developed areas, innovation in cooperation mode is particularly important given the particularity of resources and industrial base. When implementing the "school-in-factory" model, enterprise production lines can be directly introduced to campuses, allowing students to learn in a

real production environment, while providing human resources and research and development support for enterprises. The "school in the factory" is to establish teaching points or training bases within the enterprise, so that teachers and students can go into the front line of the enterprise, and promote the seamless docking of teaching content and production practice. In addition, the "cloud cooperation" model is explored, and Internet technology is used to break geographical restrictions, carry out remote teaching and online project collaboration, and open up new ways for school-enterprise cooperation. For characteristic industries, "characteristic professional colleges" can be established, such as the College of modern agriculture, the college of ecological tourism, etc., to focus on regional advantages, deepen school-enterprise cooperation in specific fields, and promote industrial upgrading. Through these flexible and diverse cooperation modes, the potential and creativity of school-enterprise cooperation can be effectively stimulated, and the process of integration of industry and education can be accelerated.

9. Conclusion

This study deeply discusses the significance and practical path of constructing the integration community of production and education in colleges in economically underdeveloped areas. Under the background of globalization and knowledge-based economy, the integration of industry and education is not only the inevitable choice of education reform, but also the key driving force to promote regional economic development and social progress. Faced with the dilemma of small scale of enterprises, lack of integration willingness and weak adaptability of education, this study puts forward a series of countermeasures and suggestions, aiming at solving the practical problems, deepening the integration of industry and education, and promoting the common development of higher vocational education and local industries.

Looking forward to the future, the construction of the integration community of industry and education still faces many challenges. With the rapid development of the economy and society and the continuous progress of industrial technology, we need to constantly optimize and adjust the strategy and path of the integration of industry and education to meet the new development needs. This study is expected to provide useful reference and inspiration for the reform of higher vocational education and industrial development in economically underdeveloped areas, and contribute to the balanced development of regional economy and the overall progress of society.

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