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Cultivation Path of Integrated Talents of Industry, Education and Creation in Higher Vocational Colleges in Ethnic Minority Areas

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Abstract:

In the context of China's strategy to build an innovative country, this paper analyses the current situation of industry-education-creation integration in foreign countries, rooted in the connotation of the integration of industry, education and creation. At present, the main means of integrating education and industry in ethnic minority areas in China are "title classes", "industrial colleges" and "factory-college integration". Its main problems are: the unilateral enthusiasm of colleges, the low willingness of enterprises to cooperate, the inconsistent aims of enterprises and colleges, and the fact that enterprises exploit students as regular employees but do not pay them as regular employees. In view of the real problems such as low integration of industry-education, weak comprehensive qualities and abilities of senior vocational construction talents in ethnic areas, low matching degree with enterprise job requirements, separation of dual-innovation education and professional teaching, and weak employability and entrepreneurship ability of senior vocational construction talents in ethnic areas, this paper puts forward the path of training high-quality technical and skilled talents with integration of industry, education and creation in ethnic minority areas in the light of the current situation of industry-education-creation integration.

Keywords:

Talent Cultivation Quality, Talent Cultivation Path, Industry-Education-Creation Integration, Ethnic Areas, Architecture Majors

1. Introduction

Over the past 70 years since the founding of the People's Republic of China, both in theory and practice, our Party has been committed to exploring the Chinese road of building an innovative country, and has gradually come out with a Chinese road of building an innovative country with clear logical clues and distinctive practical features. [1] In recent years, the reform of teaching and education in higher vocational education has also continued to take its own pace of innovation and exploration, but for quite a long period of time, higher vocational education in ethnic minority areas in

China is still trapped in the shackles. Higher vocational education in ethnic minority areas, with a simpler orientation of talent training, has caused most students of higher vocational education to choose stable jobs after graduation; it has also neglected the cultivation of innovation and entrepreneurship to a certain extent, resulting in a shortage of innovation and entrepreneurship in recent higher vocational education in ethnic minority areas. With the frequent phenomena such as the expansion of higher education and economic problems, the difficulty of employment of college students has become the focus of the whole society, and in this context, the reform of innovation and entrepreneurship education is critically urgent. Located in the northwest of Guangxi and at the southern foot of the Yunnan-Guizhou Plateau, Hechi is an important node city of the new western land and sea corridor in China. [2] It consists of 2 districts and 9 counties, with a total area of 33,500 square kilometres. 7 ethnic minorities, including Zhuang and Yao, currently live here, and there is currently one undergraduate college and one higher education institution.

2. Connotation of "Integration of Industry, Education and Innovation"

Industry is the general term for a variety of business activities consisting of various related industries with different divisions of labour and interconnections. The expansion of its core business objects and business scope can also take the form of different industrial developments to complete their respective adjustment cycles.

Education is the process of acquiring practical knowledge and skills in relevant areas through reading, listening, research, judgement, understanding, continuous exploration, experimentation and intensive practice. It is a behavioral context management model that facilitates the continuous analysis and development of one's potential, for example, the process of time in which students acquire relevant knowledge through education.

Creation means innovation and entrepreneurship, specifically, innovation and entrepreneurship refer to the further improvement of ways of thinking in order to change opinions on relevant research questions. They are further improvements or the creation of new and common approaches to new things, oriented towards innovation by explicitly presenting unique insights that are unconventional or different ideas and approaches to traditional practice. They may be divorced from reality or fully meet the economic needs of social life as a whole, in a given context, at a given time, with new fundamentals, new main approaches and new circumstances. They can make use of the relevant knowledge and relevant information for the improvement of this enterprise and can be realized through actions with certain beneficial effects. From the student's point of view, they realize the benefits of social services and independently manage the running of the company based on the knowledge and skills they have acquired.

The "industry, education and creation" refers to an ecosystem formed by the government, enterprises, schools and students, which combines the professional education content of colleges with the needs of relevant industries, and also unites innovation education with industries and professions. In the context of relevant policies, the innovation results provide new technologies or solve problems for enterprises. In essence, it promotes the innovative and optimal combination of various production factors, and ultimately realizes the social service function of colleges and universities.

The "industry-education-creation integration" talent training, on the premise of "industry-education integration, education-creation integration", adopts collaboration and co-education mode of colleges and enterprises, that is, with the enterprise as the leader and the school as the main body, to cultivate high-quality technical and skilled personnel with the ability to serve the industry, the ability to adapt to social posts, sustainable employment and entrepreneurship.

3. The Current Situation of "Industry, Education And Creation" in Higher Vocational Institutions

3.1. Analysis of "Industry, Education And Creation" Abroad

Table 1 provides a comparative analysis of the regulations, policies, platforms, support programmes and roles of industry-education-creation collaboration in the US, Japan, UK, Germany and France.

Table 1. *Comparative analysis of foreign industry, education and creation.*

No.	Country	Problem	Regulations and policies	Platform	Support programmes	Role
1	**US**	1. Low motivation and creativity of R&D personnel in universities, enterprises and non-profit R&D institutions; 2. Lack of operational mechanisms for R&D and slow transfer and industrialization of scientific and technological achievements.	1. 1980 - Bayh-Dole Act, Technology Innovation Act; 2.1986 - Federal Technology Transfer Act; 3.1988 - Omnibus Trade and Competitiveness Act; 4. 1995 - National Technology Transfer and Advance Act; 5. 1997 - Federal Technology Transfer Act; 6. 2000 - Technology Transfer Commercialization Act.	1. The Science Park was built; 2. "University-Industry Cooperation Research Centre" "Engineering Research Centre" "Science and Technology Centre" were subsequently established.	1. The Advanced Technology Programme was implemented; 2. A cooperative research institute scheme was established; 3. Innovation programmes for SMEs and technology transfer programmes for small businesses were developed.	1. The government enacts relevant legislation to ensure cooperation and innovation between industry, universities and research institutes; 2. The establishment of Science Park promotes cooperation between enterprises, schools and R&D institutions; 3. The implementation of various programmes provides opportunities for small businesses to compete in the market and promotes

						the integration of small businesses with universities and research institutions.
2	**Japan**	The development of industry-university-research cooperation is slow, equipment is not shared, and cooperation between state research institutions and private enterprises is poor; the rate of transformation of research results is low.	1. 1986 - Introduction of the Research Exchange Promotion Act; 2. 1995 - Introduction of the Basic Law of Science and Technology; 3. 1998 - Introduction of the University Technology Transfer Promotion Act.	1. Creation of an information service system.	1. In 1976, Japan established a research programme for ultra-large scale integrated circuits.	1. The sharing of scientific research equipment has been achieved, with close cooperation between national research institutions and private enterprises; 2. The government has established an industry-university-research information service system to break the constraints of time and space and to provide timely and efficient research results and academic information services; 3. The government has invested in major projects and organized creative research cooperation and technological innovation by

						enterprises, enabling the implementation of the programme to take root.
3	**UK**	The tradition of emphasizing science over technology and theory over technology application makes the cooperation between industry, university and research less effective, and it is difficult to give full play to the advantages of scientific research and talents.	1. In 1983, the government-led survey report Enhancing Research Links between Higher Education and Industry was completed; 2. In 1987, the report entitled Towards Collaboration: Higher Education - Government - Industry was published; 3. In 2004, the UK Ten Year (2004-2014) Science and Innovation Input Framework was introduced.	1. In 1986, the Council for Industry and Higher Education was established; 2. An IT website was set up to facilitate communication.	1. In 1986, the Linkage Collaborative Research Programme was developed; 2. The Knowledge Transfer Partnership Scheme was developed; 3. Transfer funds were made available; 4. A dedicated Technology Transfer Office was established.	1. Introduce policies and measures. Promote the cooperation of industry-university research, to change the slow effectiveness of cooperation in the past, and to improve the ability to transform the research results of industry-university research; 2. Strong support from adequate research funding to facilitate the transfer of university-industry research results from universities; 3. Establish special cooperation programmes to further promote the linkage between enterprises and research institutions ; 4. Establish an information technology website to

						promote communication, helping enterprises to have more college and rapid access to innovative science and technology from universities, and more convenient communication of science and technology.
4	**Germany**	Scientific research results do not contribute to real-life productivity; applied and theoretical research are not effectively bridged; and R&D capabilities of SMEs are insufficient.	1. The philosophy of running universities has changed to "education should be combined with scientific research and production"; 2. Under the leadership and support of the government, a number of university-enterprise cooperation centres have been set up.	1. The Association of Applied Technology was founded; 2. The Industrial Research Association was founded.	1. In 1997, a promotion programme for start-up companies was developed.	1. The Centre for University-Enterprise Cooperation promotes the development of talent and industry, transfers the results of scientific research into real productivity and accelerates the development of science, technology and the economy; 2. In 1949, the Franhofer was founded to obtain the latest industrial technology for the business community, while acting as a bridge between applied research and basic

						theoretical research; 3.The government established the Industrial Research Association to engage universities and R&D institutions to target applied technology problems of enterprises, solving the problems of SMEs in addressing their small scale and lack of R&D capacity, and promoting their innovative development; 4. The government has developed a promotion plan for start-up companies, promoted the establishment of innovation companies in universities, increased the employment rate of university students, and formed a regional innovation network with universities as the centre, combined with relevant R&D institutions and

						peripheral support organizations.
5	**France**	There is no in-depth cooperation between "industry, university, research and innovation"; the transformation rate of university achievements is low.	1. In 1982, the Science and Technology Guidance and Planning Act was introduced; 2. In 1984, the Higher Education Act was introduced; 3. In 1985, the Vocational and Technical Education Act was introduced; 4. In 1988, the Fund Management Act was introduced; 5. In 1999, the Innovation and Research Act, which is closely related to innovative research, was enacted.	1. In 1988, the construction of a research and technological innovation network began.	1. In 2004, the initial establishment of the "Achievement Transformation Service Centre" of the university was completed.	1. The successive introduction of these regulations has facilitated the further development of innovative cooperation between industry and universities; 2. A research and technological innovation network has been established and university research laboratories, social research institutes and private research institutes have been organized into a "permeable" complex of research and development institutions, all of which strengthen the transformation of scientific and technological achievements and provide the necessary assistance and equipment for

						innovative SMEs; 3. The role of the university's "Centre for the Transformation of Achievements" has been strengthened, with the Centre being responsible for the transfer of research results and the transformation of patents. Government departments encourage researchers to set up new businesses, support them financially and technically, and give them preferential treatment such as leave without pay.

In summary, it can be seen that foreign countries [3] have basically promoted the development of cooperation and innovation in industry-academia-research cooperation through government-led efforts to develop relevant laws, regulations and plans,etc. To put it bluntly, in the US it is primarily the national government that has re-enacted other relevant legal provisions in various ways to ensure that planning and science park construction can get off the ground, all of these regulations revolve around supporting projects that work towards collaborative innovation collaboration and innovation breakthroughs, and many of the relevant measures have positively contributed to rapid economic, scientific and technological development. [4] Japan's industry-university-research collaboration is government-led, with companies organizing in a variety of ways to create other innovative science and technology transfer agencies which reinvest in major projects affecting the implementation of new information content professional services systems in an effort to achieve collaborative innovation collaboration and continuous innovation. The UK and France have significantly improved the quality and efficiency of industry-university-research cooperation through government-led research, the development of relevant legal

safeguards, the establishment of committees, and the development of plans to address the current traditional approach of emphasizing scientific foundations over relevant technologies and theoretical foundations over technological applications, giving more full play to its unique advantages in the field of scientific research and the significant advantages of elite talent. Germany has gradually integrated the concept of running higher education institutions closely with research, teaching and other work and production. Under the guidance and continuous support of the government, a number of university-enterprise cooperation centres have been officially established to further promote the continuous development of industry-university cooperation and innovation [5].

3.2. Current Situation of Industry, Education and Creation in Ethnic Minority Areas

At present, China's higher vocational education has gone through a period of development of industry-education integration, which is still mainly based on industry-education integration or industrial colleges, and has gradually formed a series of models, such as order classes, school plants, factory learning, etc. There are relatively few models of industry-education-creation integration. School communication and integration design is a key part of the school's professional ethics education, in which the systematic cultivation of talents with high personal qualities required by various types of technology-based manufacturing enterprises is the cultivation transformation urgently required by higher vocational institutions.

3.2.1. Industry-Education Integration Training Model

The combination of order and education and training model is conducive to the in-depth participation of enterprises in running schools and promoting the mutual transformation of production, teaching and research achievements in effective communication between enterprises and schools [6]. It is a high-level model of cooperation in which industry and education are integrated. The learning management model promoted by this cooperation is highly purposeful, with a high degree of applicability of talents to enterprises and a high degree of tripartite participation of schools, enterprises and students [7]. In recent years, it has been implemented in universities across the country and has shown to be very effective.

The "school as a factory and factory s a school" are different forms that have been developed in response to the needs of schools and enterprises. Within the framework of these two models, the overall production costs of the enterprises themselves are reduced and the students are given more specific and more social practice and development opportunities accordingly.

3.2.2. Problems in the Industry-Education Integration of Architecture Majors

Guangxi Modern Polytechnic College, as the only higher vocational college in Hechi, has continuously explored the development of its own integration of industry and education. Although certain results have been achieved, the following problems still exist.

3.2.2.1. Low Level of Corporate Participation

In the process of integrating industry, academia and research, the participation of enterprises is often low for a number of reasons. Firstly, companies tend to invest a lot

of money, but it is difficult to guarantee a return. More importantly, enterprises face the risk that the talents they spend a lot of human and financial resources training may not stay in their own enterprises. Secondly, during the training process, many students need to be involved in processes such as management, production and information security education, which creates problems for companies to become deeply involved in school-enterprise cooperation.

3.2.2.2. The Value Orientation Contradiction Between Schools and Enterprises

Schools and enterprises are different in nature [8], and the goals and values they pursue are naturally different. Higher vocational institutions aim to cultivate high-quality skilled talents [9]. In the process of talent training, they pay more attention to quality training [10] and pursue high-quality employment, which means long training time. Whereas enterprises are profit-oriented, they pay more attention to the coexistence of high quality and high efficiency, exchanging low investment and high return in a short period of time. The contradiction between the pursuit of development goals and values of both sides often triggers frequent differences in the cooperative learning process, which also makes it difficult for the two to agree on cooperative teaching methods.

2.2.2.3. The Tendency for Enterprises to Exploit Students As Cheap Labour

Some enterprises tend to regard the higher education students who take part in internships as cheap labour. In order to save costs, enterprises omit the conditions for adequate training of trainees and require them to work immediately in production. In this development process, students' rights and interests are often not protected by society, and their professional skills and knowledge are not improved. In effect, they have at this point become tools for the enterprise to create economic benefits. Clearly, this type of cooperation defeats the original purpose of combining industry and education.

3.2.3. Problems of "Industry-Education-Creation Integration" of Architecture Majors

All along, innovation and entrepreneurship education in schools has also been promoted, but the results of dual innovation have not been significantly improved, and the following problems mainly exist:

3.2.3.1. Low Degree of Integration Between Industry and Education, Disconnect Between the Quality of Architecture Talents Training in Ethnic Areas and Social Market Demand

There is a live question of separation between industry and academia in the cultivation of higher vocational architecture professionals in ethnic areas, which is manifested in the poor connection between theoretical teaching and practical teaching, as well as the separation between professional teaching and industrial services; the result is that the talents cultivated are not capable of identifying, analyzing and solving problems [11] and cannot really serve the needs of the social market.

3.2.3.2. Weak Comprehensive Qualities and Abilities of Senior Architecture Talents and Low Matching Degree With The Job Requirements of Enterprises in Ethnic Areas

The comprehensive qualities and abilities of architecture professionals cultivated lack comprehensive development. In their training process, the moral education of the curriculum and the teaching of professional skills are separated from each other, and their vocational ability, practical ability and innovation ability are relatively weak, which also means that it is difficult for the trained talents to adapt to the development needs of enterprise positions.

3.2.3.3. Separation of Dual-Innovation Education from Professional Teaching, And Lack of Employment and Independent Entrepreneurial Ability of Higher Vocational Architecture Talents in Ethnic Areas

In the whole process of training construction-related professionals, the content of professional teaching and innovation and entrepreneurship education are detached from each other, resulting in the training of talents with a weak sense of innovation and a low capacity for sustainable development of employment and entrepreneurship.

Firstly, there is a general lack of innovative ideas and thinking among university students. Various science and technology competitions, entrepreneurial design competitions and practical education activities have been launched in recent years to encourage students to be innovative and entrepreneurial. Unfortunately, such incentives tend to have only a short-term effect; after the competitions and activities are over, students receive awards and teachers receive accolades, and there is essentially no further follow-up. The direction taken is generally that most research groups stop working on the relevant projects and instructors move on to other areas of research. The lack of innovative theoretical and practical projects for university students, driven by the competitive forces of new technologies, makes it more difficult to motivate school teachers and students. The severe lack of long-term feedback mechanisms for ongoing training and the absence of ideas for innovative enterprise capabilities results in a more dramatic short-term rebound situation. At the same time this also seriously neglects the development of students' inherent innovative outlook, logical thinking, reverse thinking and comprehensive ability, and can even be said to seriously affect the sustainability of students.

Secondly, there is a serious shortage of excellent teachers in innovation and entrepreneurship education. The primary task of dual-innovation education lies in the construction of innovative teacher teams. So far, most teachers of dual-innovation education in ethnic areas are school teachers engaged in basic teaching, or tutors, teachers and researchers in management positions engaged in student learning. The lack of practical experience in entrepreneurship has prevented these teachers from combining scientific theory and professional teaching well enough to provide diverse guidance to students. A more prominent problem is that the practical knowledge structure of innovation and entrepreneurship teachers is relatively homogeneous, and some of them are not even able to develop valuable courses such as innovation and entrepreneurial practices and entrepreneurial learning courses, while the comprehensive ability of good teachers to sustain innovation is weak, making it difficult to train sustainable innovators.

Thirdly, the traditional teaching mode of innovation and entrepreneurship education. In the training programmes of schools and related majors, the course contents, preliminary teaching plans and teaching contents of innovation and entrepreneurship education are not well matched, and the cultivation and improvement of entrepreneurial abilities of college students are not in place. The teaching

arrangements and teaching contents of schools have been consciously adjusted and reformed over the years, but on the whole, they have not got rid of the more traditional teaching content model, and the quality education of college students has not achieved satisfactory and optimal results. For that matter, some universities have offered courses in innovation and entrepreneurship education, but have not devoted enough time to constantly broaden students' minds and stimulate their strong interest, not to mention improving their innovation and entrepreneurship skills. Without sustained positive incentives for the development of students' innovation and entrepreneurship education, they lose confidence in innovation and entrepreneurship.

4. Construction of the "Industry-Education-Creation Integration" Talent Cultivation Path

4.1. Full Government Involvement and Guidance

The government should give full play to its role of macro-regulation. On the one hand, by improving relevant laws and regulations, the government can clarify the rules and regulations related to school-enterprise cooperation under the integration of industry, learning and innovation within the framework of the rights and obligations of schools and enterprises, thereby fully mobilizing the enthusiasm of enterprises to participate in education. On the other hand, the government should actively monitor and evaluate the market for all parties involved in economic cooperation to ensure that the integration of industry, learning and innovation operates effectively under a scientific and reasonable framework, and to improve the quality of enterprise cooperation. The implementation of relevant policies should also be a key focus of the government, which should guide school education to adapt to the development of local enterprises and encourage them to participate in the transformation and development of schools.

4.2. Construction of a Win-Win System for Schools and Enterprises

Both schools and enterprises should establish the concept of "benefit sharing and win-win cooperation" and commit to building a win-win system. The unified training of talents should be an important goal of school-enterprise cooperation. The school can export excellent talents, and the enterprise can choose to accept excellent talents for development. The two are interdependent and promote each other. In other words, both sides can achieve a win-win situation in the process of cooperation. The school receives funds from the enterprise and actively promotes the innovation of the school concept, while the enterprise receives talents from the school and in turn promotes technological progress and rapid development of production. In school-enterprise cooperation, where industry, education and innovation are integrated and optimal communication is established between the two parties, they can effectively co-create and participate in managing the talent development process.

4.3. Industry-Education-Creation Integration form Building

Innovation in the form of industry-education-creation integrated development may wish to start from the following aspects: First of all, institutions and universities is in need of reforming the traditional school management model and constructing a industry-education innovation integrated form. Enterprises may shift from independent development to regional industrial development, as it will be conducive to giving full play to regional advantages, improving the quality of talent training,

serving the development of schools and promoting the regional development of school development. Secondly, it is necessary to expand the integration of industry-education-creation integration with new connotations, from the initial simple cooperation in teaching and training to cooperation in cultural and other fields. Thirdly, Creative use of the new idea of "Internet+" to explore new directions for the integration of "industry, education and creation" will be a wise move. It goes without saying that Internet+ era has brought new technologies and new thinking, which is an important opportunity to integrate industry, education and innovation.

5. Conclusions

This paper takes the objective of training high-quality talents with "integration of industry, education and creation" as the guide, and the premise of joint cultivation by schools and enterprises. Through the integrated teaching mode of "integration of industry and training, integration of industry and creation, alternation of learning and creation", it fully discusses the quality mechanism of training talents with the support of schools, led by enterprises and participation of industries and customers, in which the government, industries, enterprises, schools and customers are the main bodies of teaching quality supervision and evaluation, and jointly realize the comprehensive quality ability of trained talents in technological innovation, employment and entrepreneurship, social services and professionalism.

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

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