Exploring the Implementation Path of School-Enterprise Cooperation in Integrating Industry and Education in Vocational Education

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Abstract. How to keep up with the national policy and improve the quality of talent training is a problem worth discussing by teachers. In order to steadily promote the integration of industry and education and school-enterprise cooperation, Construct the talent training mode of collaborative education between schools and enterprises, Improve the quality of talent training in vocational colleges, Reduce the gap between the quality of school talent training and the employment demand of enterprises, Starting from the mode and goal of talent training in higher vocational colleges, According to the relevant policies of school-enterprise cooperation on vocational education integrating industry and education, This paper analyzes the many problems existing in the process of promoting the integration of industry and education and school-enterprise cooperation in higher vocational colleges, On this basis, combined with the ideas of related work in our hospital, This paper discusses the ideas of promoting the integration of industry and education and school-enterprise cooperation, and summed up the corresponding measures of higher vocational colleges to improve the talent training objectives and the employment requirements of enterprises, It provides reference for the follow-up talent training reform and practice in vocational colleges.

Keywords: Vocational education, integration of industry and education, implementation path.

1 Introduction

The fundamental task of higher vocational education is to train high-quality skilled professionals for production, construction, management and service, strong practical ability and good professional ethics. The construction of a modern vocational education system is the overall goal of the development of vocational education in China. As China's economic development into the new normal and the rapid transformation and upgrading of industrial structure, the social demand for high-quality technical talents is more and more urgent, vocational education as a bridge of communication education and professional, is closely related to the development of economy and society, speed up the implementation of deepening teaching fusion is our country higher vocational

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colleges and industry, industry of the important issues. In December 2017, The General Office of the State Council issued several Opinions on Deepening the Integration of Industry and Education, taking the integration of industry and education as a major issue in the current reform and development of higher education. The Ministry of Education, the Ministry of Human Resources and Social Security, the Ministry of Finance and other ministries and commissions also separately or jointly issued a series of guiding policy documents, from different angles to give full play to the role of industry enterprises, actively promote the integration of industry and education, school-enterprise cooperation, improve the quality of vocational education. In December 2022, the General Office of the CPC Central Committee and the General Office of the State Council issued the Opinions on Deepening the Reform of the Construction of the Modern Vocational Education System. The Opinions proposed that focusing on deepening the integration of industry and education, promoting the integration of vocational education as the key, continuously promote the reform of the modern vocational education system, and optimize the orientation of vocational education types[1-3]. In the 13th Five-Year Plan for the Development of Chinese Civil Aviation, it is also proposed to strengthen the training of professional talents, strengthen the construction of professional and disciplines of civil aviation, broaden the training channels of professional talents such as flight, maintenance, air traffic control and airport, and improve the quality of education; improve the modern civil aviation education and training system, establish a multi-level education and training system; and build an education and training system that matches the continuous safety of civil aviation and the construction of civil aviation power. With the implementation of relevant policies and measures, the strategic position of vocational education integration and school-enterprise cooperation has been gradually clarified. After years of work, vocational education has presented a new height and a new atmosphere in the integration of industry and education and school-enterprise cooperation, and has gradually achieved great results[4-5].

In recent years, China has attached great importance to the reform of vocational education, and issued a series of policy documents from macro guidance to micro implementation. It is an important task of China's higher vocational education reform to implement the national policies into education and teaching activities[6-8]. For the first time, the Party arranged education, science and technology and talents, and proposed that "education, science and technology and talents are the basic and strategic support for building a modern socialist country in an all-round way". Enterprise development needs to rely on talents, talent training needs to rely on education. Enterprises should move forward to the training link and deeply participate in the high-quality development of education, so as to provide sufficient talent guarantee for their transformation and upgrading. Schools are the supply side of human resources, and school education should also take the initiative to connect with the industry, cultivate all kinds of talents urgently needed by enterprises, and support the development of the industry for. Integration of industry and education, school-enterprise cooperation through the school-enterprise innovation cooperation mechanism, build a diversified school-running pattern, to improve the talent training mode of vocational colleges, and realize the organic integration of education and industry innovation in the field of talent training[9-10].

In order to further enhance the closeness between vocational education qualifications and vocational skills, improve the vocational skills level and practical ability of vocational college students, various vocational colleges continue to deepen their connections with enterprises, and carry out reforms in the curriculum teaching system and practical teaching environment around the talent cultivation mode. This article focuses on the talent cultivation goals of civil aviation electronic information majors, and explores in depth the talent cultivation mode, professional course construction, construction of on campus and off campus practice platforms, vocational skills competitions, improvement of teaching staff capabilities, and expansion of student employment positions. It promotes the integration of industry and education in related majors and school enterprise cooperation in our college, improves the quality of talent cultivation, and provides experience reference for similar professional talent cultivation in related colleges.

2 Current Problem Analysis

At present, it is a critical period to promote the integration of industry and education and the continuous deepening of school enterprise cooperation. By deepening the integration of industry and education and school enterprise cooperation, vocational colleges can help break through the bottleneck of vocational education development and promote the continuous deepening of industry education integration work. Since the 18th National Congress of the Communist Party of China, the country has attached great importance to the integration of industry and education and school enterprise cooperation in promoting the development of vocational education policies. With the implementation of the national series of policies on the integration of industry and education, local governments have also closely followed the national policies and introduced supporting measures to continuously promote the development of the integration of industry and education; After years of work promotion, many difficulties in the integration of education and school enterprise cooperation have gradually emerged in reality, mainly manifested in the following aspects:

2.1 The Mechanism for Integrating Industry and Education is not Sound

The country has issued systematic guidance documents on the integration of industry and education, as well as school enterprise cooperation, and local governments have also followed national policies to introduce relevant supporting measures and guidelines. However, the direct connection between guiding policies and supporting measures is not sufficient, and some measures are not well refined. There is also no clear guidance on the rights and responsibilities between schools and enterprises, resulting in insufficient policy guarantees and implementation processes for industry education integration and school enterprise cooperation.

2.2 The Attitudes of Both Schools and Enterprises Towards Cooperation are Inconsistent

With the steady expansion of the number of graduates from vocational colleges in recent years, the number of skilled graduates who enter the workforce each year is also increasing. In addition, due to the impact of the epidemic on business operations in recent years, the demand for talent has been reduced, which has put enormous pressure on graduates from related colleges. The school has a great willingness to cooperate with enterprises to improve teaching quality and promote student employment, and actively promotes it; However, due to the relevant regulations and concerns of enterprise development and internal management, the participation of enterprises in the cooperation between schools and enterprises is not high, resulting in a disconnect between the willingness of schools and enterprises to cooperate and the promotion of work.

2.3 The Lack of Coherence in the Timeline of Industry Education Integration

In the early stage of school enterprise cooperation, relying on the incentive mechanism of policies, both schools and enterprises actively signed cooperation agreements in many fields such as teacher team cooperation, talent cultivation, employment internship base construction, industry university research cooperation, etc., and actively carried out multi-faceted cooperation, achieving good results in improving teaching level and promoting employment quality. But with the passage of time and the fading out of policies, the willingness of both schools and enterprises to cooperate gradually decreased. In the early stage, corresponding cooperation agreements were formed, which were gradually introduced in the later implementation of student training and employment, resulting in a lack of coherence in school enterprise cooperation.

2.4 Students have Low Interest in School Enterprise Cooperation

The school enterprise cooperation course is a professional skills course, mainly aimed at senior students, using practical operation skills training as the main teaching method; The course content taught mainly includes practical knowledge of the enterprise or industry, which is generally difficult to form a systematic and complete textbook, resulting in many students feeling unable to learn substantive theoretical knowledge; Some students may not be familiar with the details of school enterprise cooperation majors when filling out their early application forms, and the school's cooperation agreement requires students to participate in internship enterprises, which makes these students unwilling to participate in the internship and post-graduation job selection of cooperative enterprises; Some students are faced with the choice between employment and further education, and are unwilling to participate in the enterprise practical training internships arranged by the school, resulting in conflicts between internship time and preparation time for entrance exams; Some students are not clear about their career plans in the later stage, and their interest in the teaching content of school enterprise cooperation courses is not high, resulting in a decline in the quality of some course teaching.

3 Improvement Methods

In response to the many existing difficulties, in order to steadily promote the integration of industry and education, as well as school enterprise cooperation, it is urgent to establish a long-term mechanism for industry education integration and school enterprise cooperation through multi-party linkage and cooperation between the government, administration, and schools, using technology transfer and joint development as carriers; With the support of national policies, active cooperation from industry associations, and clarification of rights and responsibilities between schools and enterprises, relying on the talents and technologies of enterprises, and using schools as the main teaching venues, professional talent training is carried out to reduce the gap between the demand for talent skills in enterprises and the quality of talent training in schools, and to improve the quality of talent training.

3.1 Improve Institutional Measures and Establish a Long-Term Mechanism

To deepen the integration of industry and education, as well as school enterprise cooperation, it is necessary to first have support from the upper level system and improve the policy support system; It is necessary to coordinate the functional relationships among the participating government, schools, and enterprises, establish incentive and restraint mechanisms for the "dual subject" education of enterprises and schools based on policies and measures, determine the status and rights and responsibilities of both parties, and provide institutional guarantees for all parties involved in cooperation. In terms of government support, based on the national vocational education plan, we will explore new mechanisms for local governments and social forces to support the development and investment of vocational education, attract social capital and industrial funds, and support major construction and reform projects of vocational education in accordance with the principle of public welfare.

3.2 Clarify the Implementation Subject

As the main promoter of school enterprise cooperation, schools should adhere to the principle of "resource sharing and win-win cooperation", and cooperate with industries, enterprises, and domestic and foreign universities in talent cultivation, curriculum development, internship employment, technology development, and other aspects to achieve the integration of internship employment; Establish a two-way participation and interaction mechanism for industry academia cooperation in cultivating vocational and technical talents, achieving a deep integration of talent cultivation in schools with industry development and economic construction. Under the guidance of policies, both schools and enterprises determine the path and implementation methods of talent cultivation around the goals of talent cultivation. In the implementation process, achieve mutual promotion and support between enterprises and schools, build a cooperative relationship of resource sharing, close cooperation, and complementary functions, and resolve possible economic interest disputes; Clarify the status of both parties in school

enterprise cooperation and establish a mechanism of "dual drive and collaborative education" between schools and enterprises.

3.3 The Establishment of a Long-Term Guarantee Mechanism for Talent Cultivation

In order to ensure the continuity of the training process for skilled talents in vocational colleges, it is necessary to establish a continuous system and form a long-term talent training mechanism throughout the entire process. From the initial development of training plans, the mid-term implementation of training, to the later verification of talent training quality, there are continuous institutional measures in each stage to form long-term guarantees. To enhance the effectiveness of industrial integration and school enterprise cooperation, it is necessary to coordinate multiple parties, provide policy guarantees, and promote reforms in implementation. For vocational colleges, the focus should also be on curriculum and teaching reform, professional platform construction, faculty improvement, and talent cultivation quality improvement. How to reconstruct the curriculum and teaching system, cultivate high skilled applied talents, achieve seamless connection between students' learning skills and front-line positions in enterprises, and meet the new needs of modern enterprises for technical and skilled talents in the new era.

3.4 Improvement of Implementation Conditions for Talent Cultivation

Collaboration between schools and enterprises is necessary to jointly revise talent training plans, establish a talent training model that must adhere to employment orientation, establish cooperative training bases with enterprises through various channels, and form a long-term cooperation mechanism to support talent training. In order to improve the learning enthusiasm of students, it is necessary to build teaching resources and teaching platforms that are technologically progressiveness and adapt to industrial technology development. The school can combine the professional technology development route with the actual work situation to build a modern practical teaching platform, improve the practical teaching platform conditions for talent training, and improve the talent training level. Enterprises should actively participate in the revision of talent training programs in vocational colleges, leverage the advantages of enterprise resource integration, timely embed industry employment standards into school talent training programs, and assist vocational colleges in adjusting talent training objectives, optimizing curriculum systems, and clarifying professional skill standards in a timely manner. Frontline enterprises actively participate in the talent cultivation work of vocational colleges, establish an industry vocational standard system, and jointly carry out industry vocational qualification certification with vocational colleges. Establish industry vocational qualification appraisal stations, promote the participation of enterprise experts in certificate training systems, achieve effective integration of vocational education and vocational skills, and assist in talent cultivation in vocational colleges.

3.5 Improvement of Teaching Mode

By combining real teaching environments from the front line with virtual simulation technology, a teaching model that combines virtual and real elements and integrates online and offline teaching is constructed to improve the integration of theory and practice in curriculum teaching and enhance students' cognitive abilities towards the frontline work environment. By integrating online and offline resources, breaking down the boundary between virtual and real, and building a digital online teaching platform for courses, we can leverage the role of online teaching platforms in pre class preview, classroom interaction, and post class review. Integrate various types and sources of learning resources based on textbook content, and recommend resources that meet students' learning needs; According to the practical requirements of course teaching, construct visual and experiential practical teaching resources to enhance students' practical experience; Simulate the real working environment of frontline production enterprises through virtual simulation technology, establish on campus practical teaching scenarios, and enable students to have a more intuitive understanding of the enterprise's production environment and process; By simulating practical job scenarios, students can deepen their understanding of on-site work in enterprises by experiencing the relevant work of practical positions.

4 Implementation Path Analysis

The education model of industry education integration and school enterprise cooperation should follow the concept of both schools and enterprises focusing on sports personnel, and both parties should participate in talent cultivation together. The integration of industry and education, as well as school enterprise cooperation, requires breaking the problems that have arisen from traditional teaching models and focusing on the integration of engineering and learning. Whether in schools or enterprises, the principle of integrating engineering and learning should be reflected. For vocational colleges as the main teaching body, how to timely and effectively transform enterprise needs into school education plans has become the top priority in the innovation talent training process of vocational colleges. Through deep cooperation with frontline enterprises, we aim to clarify the differences between the job requirements for skilled personnel in frontline positions and the talent cultivation in schools. By referring to the professional knowledge and skills required for enterprise job positions, we will develop a curriculum teaching system and jointly build curriculum teaching resources and practical teaching platforms between schools and enterprises to reduce the gap between school talent cultivation and industry enterprise demand.

Off campus talent training bases are important platforms for school enterprise cooperation in talent cultivation; The off campus talent training base is located at the intersection of vocational job requirements and professional training system requirements. It bears the heavy burden of cultivating talents for the profession and the responsibility of cultivating the required talents for society. The construction of off campus talent training bases should aim at the actual needs of enterprises and institutions in terms of

employment, clarify the characteristics of talent training and application-oriented research orientation, and better serve the local economic development. Through school enterprise cooperation, relying on the joint construction of talent training bases by enterprises, expanding the practical environment for students' professional skills, forming a practical teaching model that combines on campus and off campus, enhancing students' ability to solve frontline problems, and adapting to subsequent job demands more quickly.

Collaborating enterprises combine frontline technical characteristics to provide technical training for college teachers, enhancing their professional skills; College teachers, combined with their professional expertise, provide theoretical and cutting-edge knowledge training for cooperative enterprises, enhance the knowledge and vision of frontline employees, and jointly promote the skill improvement of both parties. Cooperating enterprises provide positions for college teachers to practice in enterprises. College teachers regularly go to corresponding enterprises for practical training, enhance their understanding of the content and workflow of frontline work positions, introduce enterprise work problems into the classroom, and better connect with practical content to solve practical problems; During the practical training process, college teachers actively participate in skills such as enterprise technology development and process public relations, and provide effective and reasonable suggestions for enterprise development, forming an effective mechanism for joint promotion between schools and enterprises.

In terms of teacher cooperation, both schools and enterprises jointly select experts with senior professional titles and intermediate or above technical backbones to serve as part-time teachers at the school. Regular exchanges between professional teachers and part-time teachers are organized, and enterprise skills training is introduced into classroom teaching to learn and exercise during the teaching process, achieving seamless connection between students' knowledge and skills and the needs of enterprise positions. By providing software and hardware support, industry forums, industry exchange opportunities, and relevant expert and think tank resources to universities through enterprises, participating in the implementation of school enterprise cooperation projects, and further expanding the channels of university cooperation.

In the teaching process, relying on cooperative enterprises and technological development paths, a virtual simulation experimental environment is constructed through the comprehensive application of virtual reality and multimedia technology. The combination of virtual and real is used to transform abstract theoretical knowledge into digital virtual practice scenes that can be observed, interacted with, and practiced in the process. This achieves an immersive teaching experience of 5G+AR/VR that combines education with entertainment. It can solve the high-risk or extreme environments involved in physical equipment experiments, as well as the problems of irreversible and difficult detailed observation, experience, and process practice in the experimental process, and improve students' participation in course learning. Build a classroom system that integrates "job, course, competition, and certification", rely on skill competitions, form an effective learning incentive system, and enhance students' interest in learning. Relying on the 1+X certificate system of the Ministry of Education and cooperative

enterprises to carry out vocational skill level certificate certification, further enhancing the integration of students' learning level and enterprise skill requirements.

5 Conclusion

Starting from the goal of promoting mutual cooperation between schools and enterprises in the cultivation of high skilled professionals in higher vocational colleges, this article explores the relevant issues of the integration of industry and education and school enterprise cooperation in the process of cultivating applied talents in higher vocational colleges. On this basis, based on the promotion ideas of vocational colleges in school enterprise cooperation, combined with our specific teaching improvement measures, we will carry out teaching practices of industry education integration and school enterprise cooperation. By analyzing the problems of industry education integration and school enterprise cooperation, as well as exploring the follow-up implementation path, we aim to improve the curriculum teaching system, enhance the teaching platform conditions, improve the level of teacher team construction, and form a series of implementation plans to further reduce the gap between talent cultivation quality and frontline enterprise talent skill goals, and improve the quality of talent cultivation.

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