

On the Realization Path of the Integration of Production and Teaching in Higher Vocational Education

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[**Abstract**] Higher vocational education is an important way to cultivate technical and skilled talents to meet the needs of social development and talent market. As an important educational concept and mode of higher vocational education, the integration of industry and education closely combines industry and education, integrates schools and enterprises, and realizes the goal of talent training, which is more close to the actual needs and of great significance. This paper will explain how to strengthen the integration of production and education in higher vocational education from the following aspects: the background and significance of the research on the integration of production and education in higher vocational education, the importance and necessity of the integration of production and education, the key factors to achieve the integration of production and education, and the path and measures to achieve the integration of production and education in higher vocational education.

[**Key words**] integration of production and education; higher vocational education; path

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1 Research background and significance

The integration of industry and education in higher vocational education refers to the deep cooperation between higher vocational colleges and industrial enterprises, which closely combines the actual needs of industrial enterprises with the talent cultivation of higher vocational education, and promotes the development of industrial enterprises and the optimization and upgrading of higher vocational education. In recent years, with the rapid development of China's economy and the upgrading of industrial structure, the integration of production and education in higher vocational education has become one of the important ways to improve the quality of higher vocational education in China, which cultivates talents to meet the needs of the market and promotes economic development. However, there are still many problems in the practice of the integration of production and teaching in higher vocational education, such as the insufficient depth of cooperation between industrial enterprises and higher vocational colleges, and the mismatch between talent cultivation and market demand. Therefore, it is of great theoretical and practical significance to study and discuss the integration of production and teaching in higher vocational education.

1.1 The concept and connotation of the integration of production and teaching in higher vocational education

The integration of industry and education in higher vocational education refers to the establishment of an educational model of deep integration between higher vocational education and industry. It is an educational model that realizes the interaction, cooperation, coordination and win-win between industry and education in the field of higher vocational education. It aims to break the barriers of traditional education, realize the deep integration of education and industry, better cultivate high-quality talents to meet the needs of the market, and improve the quality and level of higher vocational education.

Integration of teaching modes: The integration of production and teaching in higher vocational education requires higher vocational colleges to combine teaching contents with the needs of industrial development, explore

various teaching modes, such as practical teaching, project-based teaching, work-study teaching, etc., in order to better cultivate high-quality talents to meet the needs of the market.

Integration of curriculum system: The integration of production and teaching in higher vocational education requires higher vocational colleges to match the curriculum with the needs of enterprises, improve the curriculum content, and train students' knowledge and skills to meet the needs of the market.

Integration of talent cultivation: The integration of production and teaching in higher vocational education requires that higher vocational colleges and enterprises conduct in-depth cooperation, let students learn in practice and comprehensively improve their practical ability and comprehensive quality through continuous practice.

Integration of teaching resources: The integration of production and teaching in higher vocational education requires higher vocational colleges and enterprises to share teaching resources, utilize the superior resources and technologies of industry, integrate industry and enterprise resources into teaching, strengthen teaching effectiveness, and promote the comprehensive ability of students.

1.2 The importance and necessity of industry-teaching integration in higher vocational education

The integration of industry and education refers to the effective combination of industry and education resources, and the organic combination of talent training, scientific and technological innovation and social services through the cooperation between schools and enterprises. In higher vocational education, the integration of production and education is very important and necessary. It can improve the quality of education and students, promote employment and social development, and promote industrial development and technological innovation.

Better fit for market demand: The industry can provide actual needs and skill requirements, and the education sector can cultivate talents in line with market demand, so as to better adapt to market development.

Promote student employment: With the support and cooperation of the industry, higher vocational students can better meet the actual job needs, enhance their practical ability and skill level, and improve their employment competitiveness.

Promote scientific and technological innovation: The industry can provide practical problems and needs, and higher vocational schools can solve these and provide solutions through scientific and technological innovation to promote industrial upgrading and technological innovation.

Improve teaching quality: The practical opportunities and resources provided by the industry can enrich the educational experience of higher vocational students, enhance their practical skills and application ability, and improve teaching quality and students' comprehensive quality.

Promote social development: Through the integration of production and education, higher vocational schools can provide social services, meet social needs, and promote social development and progress.

2 The development status of industry – teaching integration in higher vocational education at home and abroad

Domestic development status: Since 2015, the Chinese government has put forward a “double-qualified” teacher training plan for higher vocational education, that is, the “industry-teaching integration+double-qualified” model, to promote in-depth cooperation between higher vocational education and industrial enterprises. At present, many higher vocational colleges and industrial enterprises have cooperated to establish training bases across the country, and have explored many effective modes for the integration of production and education, such as “school-enterprise cooperation”, “co-construction of majors”, “double-qualified” and so on. **Foreign development status:** The integration of production and teaching in foreign higher vocational education has started as early as the 1990s. For example, the American Association for Vocational and Technical Education and Industrial Cooperation (ACTE) was established in 1926 to promote vocational and technical education and industrial cooperation, and help educational institutions cultivate talents that meet the needs of enterprises. European countries have also made many explorations in the integration of production and teaching in higher vocational education, such as the “dual system”

education in Germany and the “apprenticeship system” education in Switzerland. In general, the development trend of industry-teaching integration of higher vocational education at home and abroad is becoming more and more obvious. Many higher vocational colleges have taken it as an important way to improve the quality of talent training and promote industrial transformation and upgrading.

2.1 The experience and enlightenment of the integration of production and teaching in foreign higher vocational education

There are many successful experiences and practices in the integration of production and teaching in foreign higher vocational education. These experiences and practices can provide inspiration and reference for the integration of production and teaching in our higher vocational education. We can continuously optimize the industry-teaching integration mode of higher vocational education and promote the development of higher vocational education and talent cultivation by introducing advanced education models, establishing industry-university-research cooperation platforms, and strengthening the cooperation between schools and enterprises.

Germany’s dual-system education model: Germany’s higher vocational education adopts the dual-system education model, that is, close cooperation between schools and enterprises. Students learn professional knowledge and skills in schools, and carry out practical training in enterprises. This model effectively combines school education with enterprise training to cultivate high-quality talents in line with market demand.

America’s apprenticeship system: There are also many experiences in the integration of production and teaching in America’s higher vocational education, one of which is the apprenticeship system. Apprenticeship system means that students should practice and work in enterprises to gain practical experience and skills while learning theoretical knowledge in school. This system can make students better contact with the actual job needs, enhance practical ability and skill level, and improve employment competitiveness.

Australia’s industry-university-research integration: Australia’s higher vocational education adopts the mode of industry-university-research integration, that is, the establishment of cooperative relations between schools, enterprises and research institutions to jointly study and solve practical problems, and promote scientific and technological innovation and industrial upgrading. This model can facilitate the mutual promotion of education, scientific research and industry, and make contributions to social and economic development.

2.2 The current situation and problems of the integration of production and teaching in domestic higher vocational education

Certain achievements have been made on the integration of production and teaching in domestic higher vocational education, but there are still some problems and deficiencies. Specifically, the current situation and problems include:

Disjunction between education and industry: Some higher vocational colleges lack effective contact and communication with enterprises, resulting in the disjunction between education and industry. Therefore, the trained talents cannot meet the market demand.

Lack of in-depth cooperation: Although there are cooperative relations among some higher vocational colleges and enterprises, the cooperation is often superficial, lacks depth and continuity, and is unable to achieve real integration of production and education.

Backward industrial structure: The industrial structure in some places where higher vocational colleges are located is backward and cannot meet the market demand, resulting in the difficulty of employment of talents trained by them and affecting the development of higher vocational education.

Inadequate teachers: There are insufficient teachers in some higher vocational colleges. Some teachers lack practical work experience, and cannot provide practical teaching and employment guidance for students, which limit the quality and effect of higher vocational education.

Lack of marketization mechanism: Some higher vocational colleges and enterprises lack marketization

mechanism, which cannot realize resource sharing, mutual benefit and win-win results, affecting the effect of industry-education integration.

3 Key factors to realize the integration of production and teaching in higher vocational education

To realize the integration of production and teaching in higher vocational education, multiple factors should be considered. To sum up, policy support, enterprise support, talent training, joint construction, teaching staff and evaluation system are the key factors to achieve the integration of production and teaching in higher vocational education.

3.1 Government support and guidance

The realization of the integration of production and education in higher vocational education needs the support and guidance of the government, because the government has great power and resources in the field of education and industry, and can formulate policies and measures conducive to the integration of production and education in higher vocational education. Also, it can provide financial support, promote education reform, strengthen supervision and evaluation, guide industrial upgrading, and provide necessary support and guidance for the integration of production and education in higher vocational education.

Formulate relevant policies: The government should formulate policies that are conducive to the integration of production and education in higher vocational education, encourage cooperation between higher vocational colleges and enterprises, provide tax and financial support and other policy measures, and provide institutional guarantee for the integration of production and education in higher vocational education.

Financial support: The government should increase investment in higher vocational education, increase cooperation funds between higher vocational colleges and enterprises, and promote the effective implementation of industry-education integration.

Promote education reform: The government should promote the reform of higher vocational education, optimize the curriculum, teaching content and teaching methods, improve the quality of higher vocational education and the effect of talent training, and provide talent support for the integration of production and teaching.

Strengthen supervision and evaluation: The government should strengthen the supervision and evaluation of cooperation between higher vocational colleges and enterprises to ensure the effective implementation and practical effect of industry-education integration.

Guide industrial upgrading: The government should guide industrial upgrading, promote industrial transformation and upgrading, and ensure that higher vocational colleges can cultivate talents more suitable for market demand.

3.2 Self-construction of higher vocational colleges

To realize the integration of production and teaching in higher vocational education requires not only the support and guidance of the government, but also the construction and reform of higher vocational colleges themselves. Higher vocational colleges need to strengthen the construction of teaching staff, improve the education and teaching system, strengthen scientific research and technological innovation, establish a mechanism for the integration of production and teaching, and strengthen the cultivation of students' professional quality, to provide support and impetus for the realization of the integration of production and teaching in higher vocational education.

Strengthen the construction of teaching staff: Higher vocational colleges need to establish a high-level teaching staff, introduce a number of high-level teachers and professionals, improve the teaching level and scientific research ability of teachers, and provide a solid talent guarantee for the integration of production and teaching.

Improve the education and teaching system: Higher vocational colleges need to improve the education and teaching system, build the curriculum system and teaching mode that meet the market demand and talent training objectives, and improve the quality of talent training and market competitiveness.

Strengthen scientific research and technological innovation: Higher vocational colleges need to strengthen scientific research and technological innovation, strengthen cooperation with enterprises, promote technology transfer and achievement transformation, and provide technical support and innovation impetus for the integration of industry and education.

Establish industry-teaching integration mechanism: Higher vocational colleges need to establish an effective industry-teaching integration mechanism, actively explore school-enterprise cooperation mode, expand the field of industry-university-research cooperation, and improve the efficiency and effectiveness of cooperation.

Strengthen the cultivation of students' professional quality: Higher vocational colleges need to strengthen the cultivation of students' professional quality, improve students' practical ability and professional quality, and cultivate high-quality talents more suitable for market demand.

3.3 The active participation and support of enterprises

Realizing the integration of production and education in higher vocational education needs the active participation and support of enterprises. As the main body of the market, enterprises have the information and resources of the market, which can provide various resources and support for higher vocational colleges, such as places for practical teaching, education and teaching equipment, practical training projects, and scientific and technological innovation projects, improve the quality of talent training and market competitiveness of higher vocational colleges, and promote the in-depth development of the integration of higher vocational education and industry.

Provide places for practical teaching: Enterprises can provide practical production bases, laboratories, factories, enterprises and other places, and places for practical teaching and resources for higher vocational colleges.

Provide education and teaching equipment: Enterprises can provide advanced education and teaching equipment and technical support to ensure the teaching and practical training of higher vocational colleges.

Provide practical training projects: Enterprises can provide practical training projects, cooperate with higher vocational colleges to develop practical training projects, strengthen cooperation between production, teaching and research, and improve the quality of talent training and market competitiveness.

Provide scientific and technological innovation projects: Enterprises can provide scientific and technological innovation projects and technical support, cooperate with higher vocational colleges to carry out research on scientific and technological innovation, and improve the ability in scientific and technological innovation, and application.

Provide talent training and employment support: Enterprises can provide talent training and employment support for higher vocational colleges, strengthen industry-university-research cooperation, and provide more employment opportunities and career development support for students in higher vocational colleges.

4 Ways and measures to realize the integration of production and teaching in higher vocational education

The path and measures to realize the integration of production and education in higher vocational education refer to the establishment of close cooperative relations among higher vocational colleges, enterprises and governments, and the realization of the goal of integration of production and education through a series of specific measures and methods to meet the market demand and improve the level of talent cultivation. The paths and measures include:

4.1 Strengthen the formulation and implementation of industry-education integration policy

Strengthening the formulation and implementation of industry-education integration policy is one of the keys to achieve industry-education integration in higher vocational education. The government should strengthen the policy support and guidance for the integration of production and teaching in higher vocational education, establish the

docking mechanism among the government, enterprises and higher vocational colleges, strengthen the evaluation and supervision of the integration of production and teaching in higher vocational education, and promote the standardization and sustainable development of the integration of production and teaching in higher vocational education.

Formulate policies and regulations: The government should formulate relevant policies and regulations, clarify the objectives and tasks of the integration of production and education in higher vocational education, and propose corresponding measures and support policies.

Establish the docking mechanism among the government, enterprises and higher vocational colleges: The government should establish the docking mechanism among the government, enterprises and higher vocational colleges to promote the in-depth development of industry-university-research cooperation.

Strengthen the financial support for higher vocational colleges and enterprises: The government should increase the financial support for higher vocational colleges and enterprises, and encourage enterprises to invest in the industry-university-research cooperation projects of higher vocational colleges.

Strengthen the evaluation and supervision of the integration of production and teaching in higher vocational education: The government should establish the evaluation and supervision mechanism of the integration of production and teaching in higher vocational education, regularly evaluate and supervise the implementation of the cooperation projects of production, teaching and research, and promote the standardization and sustainable development of the integration of production and teaching in higher vocational education.

Strengthen the exchange and cooperation between higher vocational colleges and enterprises: The government should strengthen the exchange and cooperation between higher vocational colleges and enterprises, provide more practical teaching resources and technical support for higher vocational colleges, and promote the in-depth development of the integration of production and teaching in higher vocational education.

4.2 Establish a cooperation mechanism for the integration of industry and education

The establishment of a cooperative mechanism for the integration of production and teaching in higher vocational education is a key measure to promote the development of the integration of production and teaching in higher vocational education. This requires higher vocational colleges and enterprises to jointly formulate feasible cooperation plans and models, and establish long-term and stable cooperative relations. At the same time, it is also necessary to strengthen the quality management in the cooperation process to ensure the effective implementation of cooperation projects.

Formulation of cooperation agreement: Higher vocational colleges and enterprises should sign a cooperation agreement before cooperation to clarify the objectives, contents, responsibilities, obligations, confidentiality and other matters of cooperation to ensure the legitimate rights and interests of both parties.

Determine cooperation areas: Higher vocational colleges and enterprises should determine cooperation areas, and formulate cooperation plans and programs according to the actual needs of enterprises and the professional expertise of higher vocational colleges.

Determine the cooperation mode: Higher vocational colleges and enterprises should determine the cooperation mode according to the cooperation field and actual situation. For example, enterprises can cooperate by providing internship positions, providing teaching equipment and laboratories, jointly developing products, training teachers and employees, etc.

Establish an exchange platform: Higher vocational colleges and enterprises can establish an exchange platform to enhance mutual understanding and trust, and jointly solve problems and difficulties in cooperation through regular symposiums, seminars, technical forums and other ways.

Strengthen the quality management of cooperation: Higher vocational colleges and enterprises should strengthen the quality management in the process of cooperation, including the implementation of cooperation

projects, the evaluation of results, the sharing of information, and the protection of intellectual property rights.

4.3 Promote the integrated training of production, teaching and research for teachers

Promoting the integrated training of production, teaching and research for teachers is a key measure to promote the integrated development of production and teaching in higher vocational education. This requires higher vocational colleges and enterprises to jointly formulate feasible training plans and models, and provide corresponding training resources and support. A training evaluation mechanism should be established to encourage teachers to participate in industry-university-research integration training. At the same time, it is also necessary to strengthen the management of teachers' training and training effects to ensure that the integrated training of teachers' production, teaching and research can be effectively implemented and achieve the expected results.

Determine training needs: Higher vocational colleges and enterprises should understand each other's needs in cooperation, and establish clear demand objectives for teachers' industry-university-research integration training to ensure the achievement of training effects.

Develop training plans: Higher vocational colleges and enterprises can develop training plans and models according to training needs, for example, offering characteristic courses and research topics, participating in practical projects, and participating in internal training of enterprises.

Provide training resources: Higher vocational colleges and enterprises should provide corresponding training resources and support, such as practical opportunities in professional fields, teacher training, research funds, etc.

Establish training evaluation mechanism: Higher vocational colleges and enterprises should establish a training evaluation mechanism to evaluate and feedback the integrated training of teachers, so as to adjust and optimize the training plan and mode in time.

Encourage teachers to participate: Higher vocational colleges and enterprises should encourage teachers to participate in industry-university-research integration training, for example, setting up training incentives, providing academic exchange opportunities, etc.

4.4 Strengthen the training of students' practical ability

The integration of production and teaching in higher vocational education needs to strengthen the cultivation of students' practical ability. Higher vocational colleges should actively expand practical education resources, implement the construction of "double-qualified" teachers, strengthen the establishment of students' practical courses, implement multiple evaluation mechanisms, and comprehensively improve students' practical ability and innovation ability to meet the actual needs of enterprises and lay a solid foundation for students' employment and entrepreneurship.

Expand practical education resources: Higher vocational colleges should actively expand practical education resources, cooperate with enterprises to carry out practical courses, training base construction and practical training activities, and provide students with more abundant practical education resources.

Implement the construction of "double-qualified" teacher team: Higher vocational colleges should strengthen the construction of "double-qualified" teacher team, introduce technical backbone from enterprises as the practical teaching instructor of school-enterprise cooperation, and improve the practical ability and enterprise-oriented ability of teachers.

Strengthen the establishment of practical courses for students: Higher vocational colleges should strengthen the establishment of practical courses, strengthen the management of the whole process of practical teaching, make courses more practical, scientific and systematic, and improve students' practical ability and innovation ability.

Implement multiple evaluation mechanism: Higher vocational colleges should establish multiple evaluation mechanism, adopt comprehensive evaluation method, and comprehensively evaluate students' practical ability. At the same time, it is also necessary to strengthen the tracking and management of students' practical ability, and constantly improve and optimize the content and form of practical education.

5 Conclusion

The integration of production and teaching in higher vocational education is a deep cooperative relationship between higher vocational colleges and enterprises, and the purpose of market demand and talent cultivation is achieved through cooperation. At present, certain results on the integration of production and teaching in higher vocational education at home and abroad has been achieved, but there are still some problems and challenges. In order to better achieve the goal of the integration of production and teaching in higher vocational education, we need to explore and improve from many aspects.

Starting from the concept and research background of the integration of production and teaching in higher vocational education, this paper introduces the development status of the integration of production and teaching in higher vocational education at home and abroad. It further analyzes the key factors to realize the integration of production and teaching in higher vocational education, including the awareness of integration of production and teaching, resource sharing, cooperation mechanism, curriculum, talent training and other aspects. Finally, it puts forward the path and measures to realize the integration of production and education in higher vocational education, including establishing the integration alliance of production and education, guiding enterprise docking, building a shared training base, establishing a two-way evaluation mechanism, promoting the cultivation of double-qualified teachers, and creating a good atmosphere. These measures help to establish a closer cooperative relationship between higher vocational colleges and enterprises, and jointly promote the development of higher vocational education.

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