Implementation Path of Deep Integration of Industry and Education in Higher Vocational Education from the Perspective of New Quality Productive Forces

Xudong Li*
Guangdong Communication Polytechnic, Guangzhou, Guangdong, China
**Corresponding Author*

Abstracts: **With the continuous development and improvement of the concept of new quality productive forces, higher vocational education, as an important support for the construction of a skilled society, faces an urgent need for systemic reform in its industry-education integration model. Based on the profound impact of new quality productive forces on laborers, labor materials, and labor objects, this article deeply analyzes the main difficulties faced in the process of industry-education integration in higher vocational education, and proposes implementation paths from multiple aspects such as professional structure optimization, education mode innovation, teacher team construction, and evaluation system reconstruction. The research shows that only by building a vocational education ecosystem that accurately connects with the innovation chain and industrial chain can we provide sustainable skilled talent support for high-quality economic development.**

Keywords: New Quality Productive Forces; Higher Vocational Education; Industry-Education Integration; Implementation Path

1. Introduction

As a new form of productive force with technological innovation as its core driving force, the essential characteristics of new productive force are reflected in the innovative allocation of production factors, the deep transformation and upgrading of industries, and the revolutionary breakthroughs in technology. Higher vocational education, as the type of education most closely linked to industrial and economic development, urgently needs to deepen the integration of industry and education to resolve the structural contradictions between the supply side of talent cultivation and the demand side of industry, thus providing a solid talent guarantee for the cultivation and development of new productive force.

2. The Internal Logic of the Collaborative Development between New Quality Productive Forces and Higher Vocational Education

2.1 New Requirements of New Quality Productive Forces for Labor Quality

The emergence and evolution of new quality productive forces have raised elevated standards for workforce proficiency [1]. In this new phase, there's a pressing need to cultivate a multitude of applied talents who not only possess cutting-edge production tools but also exhibit innovative thinking and the ability to integrate interdisciplinary knowledge. From the perspective of laborers, higher vocational education must harness the synergy of industry and education to seamlessly integrate cutting-edge industrial technologies, advanced processes, and innovative methodologies into the entire teaching process. In terms of labor resources, new production tools like intelligent manufacturing necessitate the concurrent upgrading of practical training facilities and educational resources in higher vocational education. From the viewpoint of labor objects, data, as a novel productive factor, mandates the integration of modern technological components such as data analysis and cloud computing into the curriculum system, with a focus on fostering students' proficiency in handling digital labor objects.

2.2 Talent Demand for Traditional Industry Transformation and Upgrading

New quality productive forces not only cover strategic emerging industries, but also include the transformation and upgrading process of traditional industries [2]. Higher vocational

education needs to help workers master advanced technologies such as green manufacturing and lean production through continuous professional structure adjustment and teaching content updates, effectively promoting the development of traditional industries towards high-end, intelligent, and green directions. This process requires the vocational education system to keep pace with industrial development and respond promptly to the new requirements for talent quality put forward by industrial changes.

3. The Practical Difficulties and Challenges of Industry-Education Integration

3.1 Prominent Structural Contradiction between Supply and Demand

In the current practice of industry-education integration, there is a widespread phenomenon of "schools being enthusiastic while enterprises are indifferent" [3]. Many enterprises lack the inherent motivation to participate in deep cooperation due to factors such as long cost recovery periods and high talent loss risks. At the same time, the professional settings of vocational colleges often lag behind the actual development of industries, and there is a significant gap between teaching content and industry technical standards, resulting in the difficulty of cultivating talents to meet the actual needs of enterprise positions. This structural contradiction severely restricts the deep development of industry-education integration.

3.2 The Level of Cooperation Needs to be Deepened

Existing industry-education integration mostly remains at the superficial cooperation stage of joint construction of internship bases and mutual employment of experts, and has not yet touched upon deep-seated areas such as core technology sharing and collaborative innovation. Relevant surveys show that only a small number of school-enterprise cooperation involves technology research and development [4]; most cooperation is still limited to junior forms such as student internships. This shallow level of cooperation model is difficult to form a synergistic effect of knowledge diffusion and technology spillover, which restricts the value creation ability of industry-education integration.

3.3 The Innovation Mechanism is not yet Perfected

Many higher vocational colleges simply replicate existing models in the process of school-enterprise cooperation [5], lacking the ability to innovate locally based on regional industrial characteristics. The rigidity of the governance structure further restricts the vitality of cooperation, and there is a clear conflict between the traditional hierarchical management model of schools and the flat organizational structure of enterprises. Practice has shown that it is necessary to establish heterogeneous mixed-team teams across departments, majors, and schools and enterprises to effectively break organizational boundaries and achieve optimal resource allocation.

4. Implementation Path of Deep Integration of Industry and Education

4.1 Establish a Dynamic Adjustment Mechanism for Professional Structure

Align with the regional industrial development layout and establish a professional cluster development model. Higher vocational colleges should focus on the development needs of local leading industries and strategic emerging industries [6], and build a professional group system that is consistent with the industrial map. By establishing a professional early warning and exit mechanism, conducting regular professional assessments, incorporating indicators such as enrollment and employment quality, and the depth of school-enterprise cooperation into the evaluation system, measures such as reducing enrollment and suspending enrollment for lagging majors can be implemented to ensure that professional settings keep pace with industrial development.

Advancing digitalization and green transformation is an important direction for professional upgrading. Higher vocational colleges should align with the development needs of the digital economy and the national dual-carbon goals, integrate intelligent technology and environmental protection technology systems into the transformation process of traditional majors, and cultivate technical and skilled talents that meet the requirements of green and low-carbon development. This transformation not only involves updating course content, but also requires comprehensive innovation in teaching methods and evaluation systems.

4.2 Innovative Collaborative Education Model

The apprenticeship system is an effective path to achieve deep integration [7]. Through joint enrollment, joint development of training programs, and joint teaching evaluation between schools and enterprises, a talent training model that integrates enrollment and recruitment, and combines enrollment and employment is formed. This model converts work experience into credits and corporate projects into course content, achieving a high degree of unity between theoretical learning and practical training, effectively improving students' job adaptability and career development potential. Project-based teaching is an important way to cultivate innovation ability. By introducing real projects from enterprises, students are involved in the entire process from design to implementation, cultivating the ability to solve complex engineering problems. This teaching method breaks down traditional disciplinary boundaries, promotes the integration of interdisciplinary knowledge and the improvement of application ability, and enables students to acquire comprehensive professional literacy training in real work scenarios.

Building a diversified collaborative training mechanism is the key to improving the quality of education. A collaborative mechanism should be established that integrates enterprise projects into the classroom, skilled craftsmen onto the podium, teachers into enterprises, and student and teacher works into the market, achieving an organic connection between the educational process and the production process. Through the integration of industry, academia, research, training, and innovation, elements such as scientific research and social services should be integrated into the entire process of talent cultivation, broadening students' cross-disciplinary vision and composite abilities.

4.3 Strengthening the Construction of Teacher Team

Improving the appointment mechanism for part-time teachers is an important measure to optimize the structure of teaching staff [8]. Higher vocational colleges should break down academic barriers and openly recruit technical backbones and skill masters from enterprises to serve as industrial professors. At the same time, a training system for part-time teachers should be established to help them grasp the laws of education and teaching, improve their teaching abilities, and form a teaching staff structure that combines full-time and part-time teachers and complements each other's advantages.

Improving the teacher enterprise practice system is a key path to enhance practical ability [9]. It is necessary to rely on industry leading enterprises to build teacher practice bases in different professional fields, requiring professional teachers to regularly practice in enterprises. Through the two-way communication of teachers bringing topics to enterprises and enterprises bringing projects to schools, the teaching ability and technical service ability can be simultaneously improved, and a dual-teacher team that understands both theory and practice can be built.

Establishing a classification evaluation system is the institutional guarantee for stimulating teachers' motivation [10]. We should break the tendency of "paper-only" and incorporate practical achievements such as technical services and process improvement into the evaluation criteria for professional titles. Teachers who participate in industry-education integration projects should be given appropriate preferential treatment in job appointment, evaluation and selection, so as to fully mobilize their enthusiasm and creativity for participating in school-enterprise cooperation.

4.4 Build a High-Level Industry-Education Integration Platform

The city-level industry-education consortium is an important carrier for resource aggregation [11]. Relying on the consortium built in high-tech development zones, industrial parks, etc., it can effectively integrate resources from the government, industry, enterprises, and schools, achieving seamless docking between educational resources and industrial resources. This regional platform can promote deep cooperation between schools and enterprises, and promote precise matching between talent cultivation and industrial needs.

The industry-education integration community is a high-end platform for serving industrial upgrading [12]. The community, jointly established by leading enterprises in the industry, high-level universities, and vocational colleges, can carry out in-depth cooperation in technological breakthroughs, standard setting, and other aspects, promoting the deep integration of the education chain and the innovation chain. Such platforms help to solve key technical

problems in industrial development and enhance the social service capabilities of vocational education.

Shared training bases are the basic platforms supporting practical teaching [13]. Large-scale training bases integrating practical teaching, social training, and technical services should be built in accordance with the principles of productivity and sharing, and should be open to the public to improve resource utilization efficiency. Such bases should be equipped with advanced production equipment, create a real working environment, and provide students with high-quality practical training conditions.

4.5 Improve Evaluation System

Establishing a multi-stakeholder evaluation mechanism is key to ensuring the effectiveness of industry education integration [14]. Third-party institutions such as industry organizations and partner companies should be introduced to objectively evaluate professional construction and talent cultivation quality, forming a quality evaluation system with multi-party participation. This evaluation mechanism can reflect the actual effectiveness of industry-education integration from multiple dimensions, providing a basis for continuous improvement.

The evaluation oriented towards outstanding contributions serves as a crucial method for guiding vocational colleges to serve industries effectively [15]. Indicators such as the amount of technical service payments received and the conversion rate of invention patents should be incorporated into the assessment system to scientifically measure the actual contributions of colleges and universities to industrial development. This evaluation approach aids in guiding vocational colleges to place greater emphasis on fulfilling their social service functions and enhancing their capacity to serve industrial development.

Strengthening process evaluation is a means to ensure the quality of talent cultivation [16]. A whole-process tracking and evaluation system from enrollment to employment should be established, focusing on students' skill growth and career development, and forming a closed-loop quality assurance system. This evaluation method focuses on ability enhancement, can more objectively reflect the educational effect, and provide data support for teaching reform.

5. Conclusion and Prospect

This study systematically analyzes the core challenges and breakthrough paths of industry-education integration in higher vocational education from the perspective of new quality productive forces, and condenses the following key conclusions: the development of new quality productive forces requires a profound transformation of industry-education integration from local cooperation to system reconstruction, with the core being to promote the deep integration of education chain, talent chain, industry chain, and innovation chain. This process requires the construction of a governance ecosystem that involves collaboration among government, industry, enterprises, and institutions, and stimulates the participation motivation of each subject through mechanism innovation. At the same time, digital transformation is becoming a key path to enhance the efficiency of industry-education integration, which requires breaking the spatial and temporal constraints through the construction of digital platforms to promote efficient resource allocation. In addition, with the reconstruction of the global industrial chain, the cultivation of international talents and the construction of lifelong education system will become important supports for the continuous deepening of industry-education integration.

Looking ahead, the development of industry-education integration in higher vocational education will show a trend of multi-dimensional deepening, which is embodied in the following aspects: the governance system tends to be diversified, collaborative, and value-sharing; dynamic adaptation between professional structure and industrial form will become key; digital integration will move from tool support to ecological reshaping; the reconstruction of teacher capabilities and the reform of evaluation mechanisms need to be deepened simultaneously; and there is vast room for international development and the expansion of lifelong education systems. Follow-up research can focus on issues such as the construction of a multi-dimensional evaluation model for the effectiveness of industry education integration, specific implementation paths for digital transformation, and localization adaptation strategies for international cooperation. Through continuous theoretical exploration and practical innovation, it can provide solid support for higher vocational

education to empower new quality productive forces.

Acknowledgments

This research is supported by the higher education special project of Guangdong province educational science plan in 2024 "research on the mode of deep integration of industry and education and implementation path of higher vocational education serving for the development of new quality productive forces" (No.2024GXJK1099).

References

[1] Chen Peng, Li Xinran. Discourse generation and optimization suggestions for China's industry-education integration policy under the background of new quality productive forces. Education and Occupation, 2024, (23): 5-13.

[2] Ke Jingqiu, Shi Weiping. "Double Thousand" Plan in Colleges and Universities: Realistic Motivations, Key Features, and Implementation Paths. China Higher Education Research, 2025, (09): 50-58.

[3] Zhang Hao, Hu Shu. Research on the Innovation of Industry-Education Integration Mode in Vocational Education under the Background of Building a Strong Country in Education. Education and Occupation, 2025, (18): 59-66.

[4] Liu Kang, Chi Chunyang. Analysis of the carrying capacity and matching degree of higher vocational education resources. Journal of Higher Education Management, 2025, 19(03): 95-108.

[5] Wang Shan. Problems, Attribution and Sociological Explanation of Practical Courses in Higher Vocational Colleges from the Perspective of Enterprises - Also on Cultivating Students' Ability to Solve Complex Problems. China Vocational and Technical Education, 2024, (26): 41-51

[6] Liu Wuzhou, Fang Fei. The Adaptation and Practical Approach of Scientific Research Positioning in Higher Vocational Colleges from the Perspective of the Integration of Science and Education. Education Science Forum, 2025, (30): 76-80

[7] Liang Ji. Construction and Practical Path of Industry-Education Integration and Collaborative Education Mechanism in New Media Industry Colleges within the Digital Economy Field. Journal of Ningbo Education College, 2025, 27(05): 65-70.

[8] Xiao Ronghui. Reconstruction of the Path of Industry-Education Integration in Application-Oriented Universities from the Perspective of Government-University-Enterprise Collaboration. Heilongjiang Higher Education Research, 2023, 41(05): 143-148.

[9] Liu Dan, Feng Shuhu, Gao Jing. Research on the development path of professional competence of "doublequalified" teachers in application-oriented universities. Heilongjiang Higher Education Research, 2025, 43(10): 128-136.

[10] Li Sen, Du Shangrong, Zhang Shu, et al. Multi-dimensional examination of the construction of a high-quality and professionalized teacher team in the new era. Modern Educational Management, 2025, (08): 1-19.

[11] Liu Ming. The Connotation, Dilemmas, and Countermeasures of City-Level Industry-Education Consortia from the Perspective of Structural-Functional Theory. Vocational and Technical Education, 2025, 46(26): 25-31.

[12] Tang Xinqiang, Zhou Xiaoli. The internal logic, practical obstacles and solutions of industry-education integration in vocational colleges driven by new quality productive forces. Educational Theory and Practice, 2025, 45(27): 10-16.

[13] Fu Jianlin, Hu Dengzhou, Ren Qingchuan, et al. Construction of a multi-level and multi-dimensional intelligent manufacturing experimental and practical training system integrating obstetrics and gynecology education. Higher Engineering Education Research, 2025, (05): 68-74.

[14] Jia Min, Ding Jiayuan. Governance Logic and Path Selection of Industry-Education Integration Community from the Perspective of Collective Action: Based on the Analysis Framework of "Goal-System-Mechanism". Vocational Education Forum, 2025, 41(09): 24-33.

[15] Fang Yiquan, Li Yanyan, Tong Weijun. How to achieve "cooperative production": the reform logic and action strategy of higher vocational colleges under the guidance of "new double high". Higher Engineering Education Research, 2025, (05): 118-124.

[16] Liang Yujian. Empowering the cultivation of new quality talents through the reform of

education evaluation in the new era: coupling mechanism and practical path. Heilongjiang Higher Education Research, 2025, 43(08): 23-30

