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Industry-Education Integration Under the New "Double High-Quality Plan": Dilemmas and Path Reconstruction in Chinese Higher Vocational Education

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Abstract

Industry-education integration (IEI) constitutes a core mechanism linking vocational education with economic development, and its depth of implementation directly shapes the quality of skill formation within vocational colleges. Situated within the second phase of China's "Double High-Quality Plan" (DHQP), this article draws on institutional theory to examine four interlocking challenges confronting IEI in higher vocational education: misaligned incentives among participating stakeholders, a structural gap between skill supply and industrial demand, weak cross-sectoral coordination mechanisms, and an underdeveloped dual-qualified teaching workforce. The article further proposes five interconnected pathways for advancing integration: institutional innovation through multi-stakeholder governance, dynamic restructuring of specialty clusters, joint construction of practice-based training platforms, systematic development of dual-qualified faculty, and reconstruction of evaluation frameworks centered on outcomes and industry satisfaction. The central argument is that IEI, at its core, represents an exercise in institutional coupling between the education and industry systems. Meaningful integration cannot be confined to ceremonial school-enterprise partnerships; instead, it requires property-right linkages and benefit-sharing arrangements that bind educational institutions and industrial enterprises into durable communities of shared interest.

Keywords

Higher vocational education; Industry-education integration; Double High-Quality Plan; School-enterprise cooperation; Institutional coupling; Skill formation

Introduction

The Report to the 20th National Congress of the Communist Party of China (2022) calls for the "coordinated innovation of vocational education, higher education, and

continuing education" and the coordinated advancement of "general-vocational integration, industry-education integration, and science-education integration," thereby positioning IEI as a foundational pillar of China's vocational education reform agenda. In 2025, the Ministry of Education and the Ministry of Finance launched the second phase of the DHQP, which explicitly designates IEI as a core construction indicator—a signal that Chinese higher vocational education is entering a new phase of quality-focused, connotative development.

China maintains the world's largest vocational education system, with over 34 million enrolled students and an annual output of more than 70% of newly added technical and skilled personnel entering modern industries (He, 2021). Despite this scale, persistent structural issues—shallow integration, formalistic cooperation arrangements, and persistent misalignment between training outputs and industrial requirements—continue to constrain the capacity of vocational education to serve national economic and social development priorities (Ma & Guo, 2020). The question of why IEI remains so difficult to operationalize, and how it might be deepened in practice, therefore warrants sustained analytical attention.

This article addresses two core research questions: What institutional and organizational factors account for the persistent gap between IEI policy aspirations and on-the-ground implementation? And what pathways might enable more substantive forms of integration under the new DHQP framework? To address these questions, the article first delineates the conceptual contours of IEI through the lens of institutional theory, then analyzes four practical dilemmas observed in Chinese higher vocational colleges, and finally proposes a five-dimensional framework for deepening integration. The analysis draws on policy documents, empirical studies, and institutional theory to develop a conceptual argument that, while situated in the Chinese context, resonates with international debates on work-integrated learning and university-industry collaboration.

1. Theoretical Connotation and Policy Evolution of Industry-Education Integration

1.1. Core Connotation: Institutional Coupling Between Two Systems

IEI refers to an educational model in which the industrial and educational systems achieve resource sharing and collaborative development through the mutual penetration of organizational elements, the alignment of operational mechanisms, and the coupling of functional capacities (Zhu & Song, 2019). From an institutional theory perspective, education and industry constitute two distinct institutional fields, each governed by its own normative logics: the former is oriented toward skill formation and knowledge transmission, while the latter is structured around efficiency, competition, and capital accumulation. The fundamental challenge of IEI, then, lies in forging institutional arrangements that enable factor mobility and functional synergy across these two fields—a process that can be conceptualized as

institutional coupling.

When compared with conventional forms of school-enterprise cooperation, IEI operates across a substantially broader scope. In terms of participating actors, it extends beyond the bilateral relationship between schools and enterprises to encompass government agencies, industry associations, and research institutes. In terms of substantive content, it covers the full spectrum of educational activity—from program design and curriculum development to faculty development and technological research. In terms of operational logic, it depends on property-right arrangements and benefit-sharing mechanisms capable of sustaining collaboration over the long term. In terms of value orientation, it represents neither the unilateral subordination of education to industrial demands nor the instrumental extraction of educational resources by industry, but rather a relationship of mutual empowerment in which both systems stand to gain.

1.2. Policy Evolution: A Three-Phase Trajectory

The policy trajectory of IEI in Chinese higher vocational education can be broadly divided into three phases. The first phase, from the 1990s through 2013, was an exploratory period focused on school-enterprise cooperation. The Vocational Education Law of 1996 and the Demonstrative Higher Vocational College Construction Program of 2006 laid initial groundwork by promoting work-study combination models. The second phase, spanning 2014 to 2022, saw IEI emerge as an explicit policy concept: the term first appeared in official policy documents in 2014, and the National Vocational Education Reform Implementation Plan of 2019 provided systematic deployment across multiple dimensions. Since 2023, China has entered a third phase of deepened integration, marked by the legislative advancement of the Vocational Education Industry-Education Integration Promotion Law and the designation of IEI as a core indicator in the second-phase DHQP, reflecting a policy shift toward rule-of-law governance and systemic implementation.

2. Practical Dilemmas of Industry-education Integration

2.1. Misaligned Stakeholder Incentives: The Asymmetric Participation Problem

The most widely documented bottleneck concerns the asymmetric motivation of participating stakeholders. Most school-enterprise partnerships remain confined to relatively superficial arrangements such as order-class talent delivery programs, whereas deeper forms of collaboration—including the joint construction of facilities and collaborative research and development—remain comparatively rare. The profit-maximizing orientation of enterprises sits uneasily with the extended time horizons required for skill formation: educational investments rarely yield immediate economic returns, and small and medium-sized enterprises, constrained

by limited scale and tighter cost structures, exhibit particularly low willingness to participate. Although incentive policies covering finance, taxation, and land use have been introduced, many provisions remain at the level of general principles with limited operational detail, making it difficult for policy benefits to translate into tangible enterprise motivation (Shi & Hao, 2020).

2.2. Structural Supply-Demand Mismatch: Skill Formation and Industrial Requirements

A structural mismatch between educational provision and industrial demand constitutes a second major challenge. Traditional specialty programs update slowly, with curricular content frequently lagging behind industrial technological change; meanwhile, the distribution of programs targeting strategic emerging industries remains insufficient, leaving skill supply unable to keep pace with industrial expansion. Empirical studies suggest that the match rate between vocational college program offerings and regional leading industries hovers around 60%, with significant skilled-talent gaps in fields such as intelligent manufacturing, integrated circuits, and artificial intelligence (Xu, 2021). Although specialty cluster construction has partially alleviated problems associated with program fragmentation, achieving precise alignment between specialty clusters and industrial chains remains an ongoing challenge.

2.3. Weak Cross-Sectoral Coordination: Institutional Fragmentation

IEI cuts across multiple government departments—including education, development and reform, industry and information technology, and finance—yet cross-departmental coordination mechanisms remain underdeveloped, and policies frequently fail to form a cohesive whole. As public institutions, schools and as market entities, enterprises differ substantially in governance structure, operational mechanism, and value orientation. These differences create difficulties in interest coordination, ambiguous responsibility allocation, and low decision-making efficiency during collaborative endeavors. Property-right arrangements, profit-distribution mechanisms, and risk-prevention frameworks governing school-enterprise partnerships are also incomplete, further dampening enterprise enthusiasm for contributing capital, technology, and management expertise to educational endeavors (Wang, 2022).

2.4. Underdeveloped Dual-Qualified Faculty: Industrial Practice Gaps

Ultimately, IEI depends on teachers for implementation, and the quality of the dual-qualified teaching workforce directly shapes integration outcomes. Currently, the majority of vocational college teachers enter the profession directly upon completing university education, lacking frontline enterprise experience and possessing limited familiarity with the latest industrial technologies and standards.

Although national regulations require professional teachers to complete no less than one month of enterprise practice annually, heavy teaching loads, insufficient practice bases, and weak assessment and incentive mechanisms mean that compliance varies considerably across institutions. Skilled personnel recruited from industry, meanwhile, face structural barriers in professional title evaluation and salary treatment under public institution personnel systems, making genuine two-way faculty mobility between schools and enterprises difficult to achieve.

3. Path Reconstruction for Deepening Industry-Education Integration

3.1. Institutional Innovation: Multi-Stakeholder Collaborative Governance

Deepening IEI requires, first and foremost, the removal of institutional blockages. Local governments should establish vocational education joint conference systems that consolidate resources dispersed across departments into cohesive policy frameworks. At the institutional level, colleges should introduce council or board governance structures with substantial participation from industry and enterprise experts, ensuring that industrial requirements permeate the entire governance process. Interest-linkage mechanisms are equally critical: schooling arrangements such as joint-stock and mixed-ownership models can be explored, enabling enterprises to participate through contributions of capital, technology, equipment, and management expertise, and thereby forming long-term mechanisms of shared benefit and shared risk.

3.2. Demand-Oriented Restructuring: Dynamic Specialty Cluster Adjustment

Specialty clusters constitute the primary locus of IEI. Higher vocational colleges should establish dynamic adjustment mechanisms for specialty clusters anchored in regional leading industries and strategic emerging industries: constructing specialty clusters aligned with industrial chains so that program layout broadly matches industrial structure; conducting regular talent-demand surveys jointly with industry and enterprises to inform program planning and enrollment adjustments; and promptly integrating industry standards, new technologies, and new processes into curricula through the joint development of modular courses and loose-leaf textbooks by schools and enterprises.

3.3. Joint Training Platforms: Substantive Integration Infrastructure

Training bases serve as the substantive infrastructure of IEI. Higher vocational colleges can collaborate with leading enterprises to construct high-level training bases integrating practical teaching, social training, technological research, and skills certification, introducing real enterprise production lines and projects to

establish teaching factories with production functions—the "factory-in-school" model. Enterprises, conversely, can develop "school-in-factory" facilities by offering apprenticeship positions and hosting internship placements. Both types of bases should actively connect with city-level industry-education consortia and industry-based IEI communities to share quality resources and improve utilization efficiency.

3.4. Dual-Qualified Faculty Development: Strengthening Industrial Practice Competence

The teaching workforce is the most decisive factor in IEI quality. Higher vocational colleges should treat enterprise practice as a mandatory professional requirement, ensuring that professional teachers accumulate no less than six months of enterprise practice experience every five years. In faculty recruitment, the emphasis on formal academic qualifications should be tempered by greater attention to practical competence, with priority given to recruiting high-level technical and skilled personnel from industry. Concurrently, the dual-qualified teacher recognition and professional title evaluation systems should be refined, incorporating technological innovation, patent achievements, and social service contributions into evaluation criteria, and opening channels for two-way personnel mobility between educational institutions and industrial enterprises.

3.5. Evaluation System Reform: Quality Assurance Reconstruction

The orientation of evaluation standards powerfully shapes institutional behavior. An IEI evaluation indicator system centered on employment quality, technological contribution, and enterprise satisfaction should be constructed, with integration effectiveness serving as an important measure of schooling quality. The evaluative ecosystem should also be diversified, with the participation of industry, enterprises, and third-party institutions, to break the mono-pattern of internal self-evaluation within the education system. Combining process evaluation with outcome-based evaluation will guide vocational colleges to proactively align with industry and shift IEI from a top-down compliance-driven exercise to a bottom-up initiative motivated by shared strategic interest.

4. Emerging Practice Models

At the operational level, several replicable IEI models have emerged across China. City-level industry-education consortia, anchored in industrial parks, connect vocational colleges, industrial enterprises, and research institutions within a region, with the aim of linking the education chain, talent chain, industrial chain, and innovation chain; to date, 34 national-level consortia have been established. Modern industry colleges, jointly built by vocational colleges and leading enterprises, feature jointly developed training programs, co-designed curricula, and shared faculty,

achieving precise alignment between specialty programs and industrial sectors. The Chinese-style modern apprenticeship system, characterized by dual-subject education from schools and enterprises and dual-identity development for students, has been piloted since 2015, with over one thousand vocational colleges participating. Approaching integration from the regional, institutional, and instructional levels respectively, these three models together constitute a complementary practical system that is gradually maturing.

5. Conclusion

IEI is a systemic project involving multiple stakeholders across education, industry, and government. Facing the new requirements of the second-phase DHQP and the evolving circumstances of industrial transformation and upgrading, higher vocational colleges need to take institutional innovation as the breakthrough point, specialty cluster construction as the organizational carrier, training base co-construction as the substantive platform, dual-qualified faculty development as the foundational support, and evaluation system reform as the quality guarantee, in order to continuously push integration toward greater depth. Stable interest linkages must be established among all participating parties so that vocational education and industrial development reinforce one another, providing the talent and skills infrastructure required for the construction of a manufacturing powerhouse.

This analysis has several limitations that future research might address. First, the argument is primarily conceptual and policy-based; empirical validation through case studies or large-scale survey data would strengthen its conclusions. Second, the analysis focuses on the Chinese national context; comparative research examining how similar integration challenges manifest in different national systems would enhance the generalizability of the institutional coupling framework. Third, the article does not examine variation across different industrial sectors or regional contexts, which represent promising avenues for further investigation.

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