

The Practical Path of Double-High Construction in Private Higher Vocational Colleges from the Perspective of Industry-Education Integration

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Abstract: *The Double-High Construction in private higher vocational colleges differs significantly from that in public institutions in terms of property rights structure and resource acquisition modes, and its connotation places greater emphasis on the autonomous integration of educational resources and market-oriented regulatory capacity. Industry-education integration, as a core channel through which external industrial resources are embedded into educational elements such as faculty, curriculum, and training equipment, enhances the responsiveness of professional clusters while simultaneously creating a tug-of-war between the short-term nature of enterprise demands and the long-term nature of educational regularities. However, the differences in resource acquisition capabilities caused by property rights arrangements, the asymmetric dependency dilemma in school-enterprise cooperation, and the lag in internal governance response to industry-education collaboration collectively constitute the structural constraints on the Double-High Construction in private higher vocational colleges. In response to these constraints, three driving pathways are proposed: the dynamic mapping method between professional clusters and industrial chains; the modular curriculum restructuring based on job competency; and the closed-loop promotion mechanism for the capability iteration of dual-qualified teachers. Relying on the organizational characteristics of private higher vocational colleges, namely the short decision-making chain and great management autonomy, these three pathways provide an operable technical framework for the Double-High Construction from the perspective of industry-education integration.*

Keywords: *private higher vocational colleges; Double-High Construction; industry-education integration; structural constraints; pathway design*

Introduction

Private higher vocational colleges occupy a significant share in China's higher vocational education system, and their Double-High Construction faces a resource environment and operational rules that are entirely different from those of public institutions. Lacking stable financial support from government appropriations, private higher vocational colleges must rely on tuition income, returns from social services, and limited donations to maintain their educational operations. As a result, the process of improving high-level professional clusters and high-level educational capabilities is highly dependent on internal governance efficiency and the depth of external industrial resource embedding. Industry-education integration is regarded as a key mechanism for bridging the boundary between schools and industries, but its operation in the private context is not naturally smooth. The closure of property rights weakens the willingness of enterprises to make long-term investments; asymmetric dependency tilts the terms of cooperation toward the demands of enterprises; and the information filtering and misalignment of authority and responsibility in internal governance further delay the responsiveness of industry-education collaboration. Existing studies mostly discuss Double-High Construction or industry-education integration from the perspective of public institutions, with relatively few focusing on the feasible pathways for private higher vocational colleges under dual constraints. Therefore, it is necessary to clarify the logical connection between industry-education integration and the Double-High Construction in private higher vocational colleges, identify its structural constraints, and accordingly design actionable implementation plans. This research is of clear necessity for improving the development theories of private higher vocational colleges and enhancing the actual transformation efficiency of industry-education integration.

1. Logical Connection between Industry-Education Integration and Double-High Construction in Private Higher Vocational Colleges

1.1 Definition of the Connotation of Double-High Construction in Private Higher Vocational Colleges

The connotation of Double-High Construction in private higher vocational colleges differs from the standardized advancement model of public institutions, which relies on fiscal appropriations. Constrained by the property rights structure and resource acquisition methods, private higher vocational colleges, when pursuing high-level professional clusters and high-level educational capabilities, place greater emphasis on the autonomous integration of educational resources and market-oriented regulatory capacity, while also needing to balance the self-equilibrium of input-output benefits. The core of Double-High Construction lies in enhancing the responsiveness of professional clusters to regional industrial changes through internal governance optimization, while maintaining financial sustainability. This connotation binds together the quality of talent cultivation, the structure of faculty echelons, and the efficiency of facility input-output, forming a unique logic of quality improvement under the private system, in which resource turnover efficiency becomes a key observational indicator for measuring construction effectiveness.

From the operational perspective, the Double-High Construction in private higher vocational colleges also implies the requirement for cultivating organizational resilience. Due to the lack of stable fiscal support, their high-level development often relies on the reinvestment of tuition income and social service returns, which necessitates that the Double-High goals form a closed loop with market signals such as student enrollment attractiveness and graduate employment competitiveness. Specifically, the "high level" of professional clusters is manifested in the real-time alignment capability between curriculum content and job skills, rather than the mere accumulation of assessment indicators. Therefore, the definition of the connotation of Double-High Construction in private higher vocational colleges should be grounded in the synergistic improvement of resource utilization efficiency and teaching output under property rights constraints, avoiding the mechanical application of the static evaluation framework of public institutions. This understanding of connotation also provides an analytical starting point for the subsequent identification of structural constraints^[1].

1.2 The Embedding Mechanism of Industry-Education Integration into Educational Elements

As a channel through which external industrial resources enter the educational system, industry-education integration produces structural embedding into the elements of faculty, curriculum, and training equipment in private higher vocational colleges. At the faculty level, the embedding mechanism is manifested in the participation of enterprise technical backbone in teaching through part-time lecturing and project guidance, which substitutes for the functional allocation of some theory-oriented teachers and thereby alters the composition ratio of faculty capabilities. The embedding of curriculum elements is reflected in the fact that task modules oriented by work processes are disassembled and directly written into the syllabus, replacing the discipline-based arrangement of knowledge, thus making the correspondence between learning content and production procedures more transparent. In terms of equipment elements, industry-education integration often takes the form of equipment donations or jointly built laboratories to implant enterprise-level technical standards into on-campus practical training, thereby changing the original pace of asset depreciation and renewal and shortening the waiting cycle for students to access cutting-edge equipment.

A deeper embedding mechanism occurs at the middle and back-end stages of the educational process, namely the alignment between student competency evaluation and employer standards. By establishing a job skill inventory, industry-education integration forces private higher vocational colleges to adjust credit allocation and assessment methods. For example, enterprise participation in graduation project scoring or the process documentation of on-the-job internships opens an external interface to the otherwise closed academic evaluation system. This embedding does not rely on administrative directives but occurs naturally through resource exchange and benefit sharing. Due to their flexible property rights, private higher vocational colleges are often able to complete this embedding more quickly, yet they simultaneously face a tug-of-war between the short-term nature of enterprise demands and the long-term nature of educational regularities.

1.3 The Adaptive Relationship between Double-High Goals and the Demands of Industry-Education Integration

The construction of high-level professional clusters within the Double-High goals essentially requires that professional directions form a stable mapping with industrial chains. In contrast, the demands of industry-education integration are more focused on enterprises obtaining immediately usable human resources and technical service support, and there exists a temporal discrepancy between the two. The adaptive relationship is first embodied in the flexible design of professional cluster layout: private higher vocational colleges need to establish flexible micro-majors or modular curriculum packages, while maintaining the stability of the core professional content, to accommodate the phased talent demands proposed by enterprises. Such a design ensures that the long-term accumulation of the Double-High goals is not disrupted by short-term cooperation demands, while simultaneously meeting the enterprise's requirements for skill matching^[2].

Another dimension of the adaptive relationship lies in the analysis of the overlap in resource investment directions. Double-High Construction tends to prioritize hardware upgrades and faculty training, whereas the demands of industry-education integration focus more on students' job adaptation speed and project collaboration capabilities. By constructing a competency matrix that transforms the two types of goals into quantifiable learning outcome indicators, an overlapping area can be identified. For example, the enterprise requirement for shortening the time for new employees to become proficient aligns with the Double-High goal of improving talent cultivation quality at the teaching segment of "job task decomposition training." Private higher vocational colleges, leveraging their advantage of a short decision-making chain, can quickly adjust the proportion of practical training hours in the curriculum, so that the Double-High goals are no longer suspended above external demands but are embedded into the procedural links of daily teaching.

2. Structural Constraints on the Double-High Construction in Private Higher Vocational Colleges

2.1 Differences in Resource Acquisition Capabilities under Property Rights Arrangements

The property rights structure of private higher vocational colleges is typically composed of individual or corporate capital, and the ownership of assets and the distribution of returns directly determine the narrowing of resource acquisition channels. Unlike public institutions, private higher vocational colleges are unable to obtain stable funding for equipment renewal and faculty training through fiscal appropriations; their resource accumulation relies mainly on tuition income, returns from social services, and limited social donations. This property rights arrangement often leads to the adoption of extended depreciation strategies for teaching facility investment, causing the renewal cycle of training equipment to lag significantly behind the pace of industrial technological iteration, thereby constraining the equipment configuration requirements of high-level professional clusters for advanced technological facilities in the Double-High Construction. The differences in resource acquisition are also reflected in the talent recruitment process, where the higher market-level salaries for industry backbone personnel must be paid from the surplus of educational operations, resulting in a relatively high proportion of theory-oriented teachers in the faculty echelon, while the introduction of dual-qualified personnel with production-line experience is restricted.

From the perspective of asset operation, the closure of property rights in private higher vocational colleges also limits the ways in which external capital can enter. Due to the lack of mature channels for property rights transfer, enterprises find it difficult to obtain clear guarantees of asset rights and interests after investing equipment or funds, which reduces their willingness to make long-term commitments in industry-education integration. Meanwhile, when applying for special construction loans or social financing, private higher vocational colleges often face high credit review thresholds because of their non-profit attributes and weak capacity for property rights mortgage. The differences in resource acquisition capabilities ultimately manifest as a stratified pace of project advancement in the Double-High Construction: the achievement rate of hardware-related indicators is generally lower than that of software-related indicators, and the insufficient density of equipment sharing among professional clusters directly affects the degree of authenticity restoration in job skill training.

2.2 The Asymmetric Dependency Dilemma in School-Enterprise Cooperation

The cooperative relationship between private higher vocational colleges and enterprises often

exhibits unilateral dependency characteristics. Enterprises control production orders, technical standards, and job hiring interfaces, while private higher vocational colleges mainly provide interns and basic labor. This asymmetry in dependency causes the implementation of cooperation terms to lean toward the demands of enterprises. Specifically, when jointly formulating talent cultivation plans, enterprises tend to reduce basic theory class hours and increase hands-on operational training that enables immediate employment, which creates tension with the Double-High Construction goal of emphasizing sustainable development capabilities. In order to obtain training equipment or part-time teacher resources, private higher vocational colleges sometimes have to accept exclusive cooperation conditions proposed by enterprises, such as restricting students' access to recruitment information from other similar enterprises, thereby weakening the autonomous space for career choice^[3].

The asymmetric dependency is also reflected in the uneven distribution of risks associated with cooperation disruption. When industrial fluctuations occur or corporate strategies shift, enterprises can withdraw from cooperation at any time with limited losses, whereas private higher vocational colleges bear sunk costs because they have already adjusted their curriculum modules and configured specialized training venues according to enterprise requirements. This dilemma is particularly pronounced in private higher vocational colleges, since their student enrollment scale and operational stability are highly dependent on the job absorption capacity of a few core partner enterprises. To avoid being put in a passive position, some institutions attempt to simultaneously engage with multiple enterprises to achieve resource complementarity; however, constrained by faculty workload and teaching scheduling cycles, the coordination costs of parallel embedding with multiple enterprises rise rapidly. Asymmetric dependency is essentially an inevitable outcome of unequal bargaining power over resources, which constrains the autonomous planning space of Double-High Construction at the professional cluster level.

2.3 The Response Lag of Internal Governance to Industry-Education Collaboration

The internal governance structure of private higher vocational colleges often adopts the president responsibility system under the leadership of the board of directors. Although the decision-making chain is shorter than that of public institutions, there still exists information filtering between the professional teaching line and the administrative management line. Course adjustment applications at the departmental level need to undergo step-by-step review by multiple functional departments such as academic affairs, asset management, and human resources, whereas the demands for job skill changes proposed by enterprises in industry-education integration often require responses within one teaching cycle. This time lag causes the update speed of course content to be slower than the iteration speed of industry skills, resulting in a disconnect between the task modules in practical training projects and the actual processes of enterprises. Another source of delay is the faculty evaluation system. The existing professional title assessment emphasizes teaching hours and paper publications, while the performance weight for teachers' involvement in industry-education collaboration activities such as enterprise research and curriculum restructuring is relatively low, which weakens the response motivation at the grassroots implementation level.

A deeper constraint is reflected in the allocation of authority and responsibility for professional cluster leaders. Although private higher vocational colleges theoretically enjoy greater autonomy in personnel management, in practice the resource allocation authority of professional cluster leaders is rather limited; the establishment of cross-disciplinary course teams or the procurement of specific equipment still requires approval from higher-level management. Industry-education collaboration requires that professional clusters can quickly adjust curriculum combinations, replace practical training content, and introduce enterprise mentors, yet the current governance structure fails to provide routine authorization channels for such flexible adjustments. When enterprises propose urgent training needs or joint development projects, the time consumed by the approval process often exceeds the waiting window that enterprises can tolerate, resulting in the loss of cooperation opportunities. The response lag of internal governance keeps industry-education integration at the agreement level, making it difficult to enter the procedural operation of daily teaching.

3. Pathway Design for Driving Double-High Construction through Industry-Education Integration

3.1 Dynamic Mapping Method between Professional Clusters and Industrial Chains

The construction of professional clusters needs to break away from the fixed catalog-based approach to professional combination and instead establish a flexible mapping framework that corresponds to the distribution of job clusters within industrial chains. Private higher vocational colleges can adopt a job task flow analysis tool to decompose the target industrial chain into three types of activity units—core processes, auxiliary processes, and extended services—and then map these onto shared basic courses, directional module courses, and extended elective courses within the professional clusters. The core of the mapping method lies in establishing a set of two-way adjustment rules: when process changes or new job categories emerge in the industrial chain, enterprise feedback forms or graduate tracking data trigger the replacement of course content in the corresponding majors, with the replacement magnitude controlled within 15% of a single module to ensure the stability of the professional clusters. This process does not require overturning the original cultivation plan; instead, it completes partial updates through preset interface modules^[4].

The continuous operation of dynamic mapping depends on the support of data structuring. Private higher vocational colleges can establish a reference database for professional clusters and industrial chains, which includes job skill description documents, equipment operation specification texts, and time-sequence breakdown diagrams of typical work tasks. At the beginning of each semester, program leaders organize enterprise personnel and teaching faculty to jointly compare the differences between the database content and the current teaching syllabus, generating a list of discrepancy items. High-priority discrepancy items in the list are directly incorporated into the practical training projects of the next teaching cycle, while low-priority ones are allocated to elective modules or extracurricular activities. This mapping method does not aim for full-chain coverage; instead, it focuses on the three to five job clusters with the highest employment density in the industrial chain, builds the core framework of professional clusters around them, and flexibly integrates the remaining links through modular combination.

3.2 Modular Curriculum Restructuring Based on Job Competency

Modular curriculum restructuring takes the job competency inventory as its starting point, replacing the traditional chapter-based arrangement of knowledge. Operationally, the typical work tasks of the target position are first decomposed into several independently teachable competency units, each corresponding to three to five specific operational indicators or judgment criteria. Private higher vocational colleges can extract relevant content fragments from existing courses based on these indicators and repackage them into learning modules of four to eight class hours. Clear input-output relationships are established between modules, with the assessment results of the preceding module serving as the prerequisite for entering the subsequent module. This restructuring approach transforms the curriculum structure from a fixed and integral whole into a stack of replaceable and sortable modules, allowing different students within the same major to choose different module combination pathways according to their employment intentions.

The practical constraint faced by modular restructuring is the fragmentation of faculty assignment and classroom scheduling. To address this issue, a biweekly rotating scheduling mode can be adopted: the first two weeks are dedicated to intensive instruction of theoretical foundation modules, while the following two weeks are arranged for practical training modules, with the two maintaining synchronized correspondence in content. Each module is equipped with an independent assessment package, including an operation checklist and scoring rubrics; students can accumulate credits only after passing the module assessment. The information on job skill changes provided by enterprises can be directly mapped onto the update of a specific module, without requiring adjustments to the entire curriculum system. Private higher vocational colleges, due to their greater autonomy in academic administration, can implement this modular scheduling more conveniently; however, they should control the number of modules between eight and twelve to avoid losing control over instructional organization costs caused by excessive subdivision^[5].

3.3 Closed-Loop Promotion Mechanism for the Capability Iteration of Dual-Qualified Teachers

The capability iteration of the dual-qualified teacher team requires the establishment of a

closed-loop process that can be run repeatedly, rather than relying on one-time training activities. The starting point of the closed loop is the job skill tracking report at the end of each semester, which is provided by partner enterprises and includes a list of technical changes and requirements for operating new equipment for the next quarter. Based on this report, private higher vocational colleges compare against the inventory of skills held by their dual-qualified teachers and identify skill gaps. In response to these gaps, short-cycle specialized training tasks are designed, which can be implemented by having teachers enter enterprise production lines to complete a specified duration of on-the-job observation and operation, or by having enterprise technical backbone come to the campus to conduct demonstrations of equipment operation and disassembly. After the training, the effectiveness of teacher capability improvement is verified through dual validation of simulated teaching and practical assessment. The assessment results are recorded into the teacher capability profile, serving as baseline data for the next round of skill tracking^[6].

The sustained operation of the closed-loop mechanism depends on the way capability iteration is connected to teacher performance. Private higher vocational colleges can incorporate the progress of filling skill gaps into the conversion coefficient of semester workload, granting corresponding class-hour coefficient bonuses for each completed iteration. At the same time, a dynamic adjustment window for dual-qualified teacher capability rating should be established, with rating applications open once per academic year; teachers may upgrade their rating upon submitting proof of skill mastery or equipment operation certification issued by enterprises. To prevent the closed-loop mechanism from becoming a mere formality, an early warning rule for capability withdrawal should be put in place: teachers whose same skill gap remains unfilled for two consecutive rounds of skill tracking will trigger a remedial procedure. This closed-loop design transforms the construction of the dual-qualified teacher team from a static standard-attainment process into a routine update cycle that maintains a synchronous pace with technological changes, conforming to the inherent requirement of industry-education integration for the continuous adaptability of the teaching workforce.

Conclusion

Proceeding from the dual logic of property rights constraints and the embedding of industry-education integration, this study has defined the distinctive connotation of Double-High Construction in private higher vocational colleges, and revealed three types of structural constraints, namely differences in resource acquisition capabilities, the asymmetric dependency dilemma, and the response lag of internal governance. On this basis, three practical pathways were constructed: the dynamic mapping method between professional clusters and industrial chains, which maintains the elastic updating of professional clusters through job task flow analysis and reference databases; the modular curriculum restructuring based on job competency, which encapsulates knowledge modules with competency units and reduces organizational costs through biweekly rotating scheduling; and the closed-loop promotion mechanism for the capability iteration of dual-qualified teachers, which utilizes semester-based skill tracking reports and performance conversion coefficients to form a routine cycle of identification, training, verification, and updating. Future research may further examine the applicability boundaries of the three pathways across different types of professional clusters, explore solutions for improving mapping efficiency supported by digital technologies, and investigate the quantification and sharing mechanisms of teaching coordination costs when multiple enterprises are embedded in parallel. In addition, the boundary of flexible authorization for professional cluster leaders in the internal governance of private higher vocational colleges also merits in-depth exploration.

Fund Projects

This paper is the research result of the project "Exploration on the Construction Path of 'Double-High' Professional Groups and the Construction of Industry Colleges in Private Higher Vocational Colleges" (Project No. MBXH22YB441) of the Sichuan Private Education Association.

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