

# Industry-Education Integration Optimization Pathways for Higher Vocational Colleges Aligning with Regional Key Industries

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**Abstract:** *The deep-seated difficulties in industry-education integration between higher vocational colleges and regional key industries stem from structural conflicts between educational and industrial logics. Using institutional logics theory as an analytical framework, this study conducted semi-structured interviews with 24 participants from two higher vocational colleges and four enterprises, followed by thematic analysis using NVivo. The research reveals systematic mismatches between the two parties in terms of legitimacy authority, temporal horizons, and normative requirements. Actors engage in dynamic negotiations through strategies including resource exchange, rule adaptation, and discourse reconstruction. The outcomes of these negotiations become embedded in cooperation frameworks in three forms: interface rules, marginal adjustments, or structural contradictions. The study uncovers the micro-dynamics of industry-education integration—"conflict triggers—strategic negotiation—institutional embeddedness"—providing both theoretical and practical references for optimisation pathways.*

**Keywords:** *Industry-education integration; institutional logics; higher vocational colleges; college-enterprise collaboration; qualitative research*

## 1. Introduction

Deepening industry-education integration constitutes a core pathway for achieving high-quality development in higher vocational education. An integrated ecosystem that organically connects the "education chain, talent chain, industrial chain, and innovation chain" has become a critical source of talent and technological support for industrial transformation and upgrading. However, despite strong policy promotion, the persistent problem of "two separate systems" remains entrenched in practice, manifesting as superficial cooperation, insufficient precision in talent cultivation, and poor technology transfer. The fundamental crux lies in a structural conflict between the inherent operational logic of the educational system and the market-driven, technology-oriented logic of the industrial system—a conflict that has yet to be adequately revealed.

## 2. Literature Review

This study focuses on the conflicts and negotiation mechanisms between the institutionalised logic of education and the production-operational logic of industry in the process of higher vocational colleges aligning with regional key industries. Existing research has addressed this core issue across three main dimensions: the practical dilemmas of industry-education integration, theoretical analysis of internal conflicts, and exploration of optimisation pathways, providing a foundation for this study.

### 2.1 Practical Dilemmas of Industry-Education Integration

Scholars generally highlight the prominence of "shallow integration" and the "two separate systems" phenomenon. From the perspective of participating stakeholders, weakened enterprise willingness to participate represents a significant constraining factor (Zheng & Qi, 2024). Institutional capacity deficiencies (Yang et al., 2025), along with faculty knowledge and service capability bottlenecks (Cui & Zhao, 2025), have also been identified as critical barriers. These studies collectively

articulate the multiple dilemmas of industry-education integration at macro-mechanism, meso-stakeholder, and micro-capability levels, providing empirical context for understanding institutional logic conflicts.

## ***2.2 Research on Institutional Logic Conflicts***

The difficulties of industry-education integration originate from differences in the inherent operational logics of educational and industrial systems. Fang (2024) noted value gaps between colleges and enterprises from a complex adaptive systems perspective. Xie et al. (2024), through textual analysis of institutional self-evaluation reports, found that the transformation of industry-education integration forms from "single virtual entities" to "diverse substantive entities" in professional cluster governance requires further breakthrough, reflecting tensions between organisational governance logic and industrial collaboration logic. Wang and Shao (2023) explicitly proposed three internal requirements: industrial demand logic, talent cultivation logic, and organisational operation logic. However, most of these studies remain at the level of identifying logic types or analysing macro-level contradictions.

## ***2.3 Exploration of Optimisation Pathways and Mechanisms***

Scholars have proposed optimisation pathways and mechanisms from various perspectives. Some emphasise systemic construction and model innovation, suggesting that high-quality industry-education integration should promote the formation of a new pattern of "point-driven coverage and chain-connected clusters" (Zhou & Yue, 2025). Li and Chi (2023) proposed a "scenario-driven" optimisation model, advocating for the extension of cooperation spaces through demand scenarios. Regarding operational mechanisms, Gao and Pei (2024) explored the coupling development mechanisms of science-education integration and industry-education integration under the "one coordination, three integrations" framework, encompassing goal, motivation, coordination, and guarantee mechanisms. Based on symbiosis theory, Cao (2024) attempted to construct an integrated and mutually beneficial talent cultivation model. Additional research has focused on evaluation and incentive mechanism reform (Jiang, 2023; Li & Chen, 2023).

However, existing research has the following limitations: (1) Research perspectives tend to be macro-level and static, lacking in-depth analysis of micro-level interaction processes in daily cooperation. (2) The dynamic "conflict-negotiation" process has been inadequately revealed, with insufficient detailed analysis and theoretical refinement of how conflicts manifest in specific events and what strategies are employed to resolve them. (3) Theoretical focus and contextual integration remain loose, failing to adequately incorporate the technological iteration and efficiency demands of regional key industries into analysis of conflicts with higher vocational college talent cultivation systems.

Therefore, this study aims to address these gaps by employing institutional logics theory and qualitative research methods to deeply analyse the patterns of logic conflicts and dynamic negotiation processes between higher vocational colleges and regional key industries in micro-level interaction fields, thereby providing insights with greater contextual depth and theoretical explanatory power.

## **3. Research Design**

### ***3.1 Theoretical Framework***

This study adopts Institutional Logics Theory as its core analytical framework. This theory posits that different institutional domains possess their own core logics, encompassing elements such as sources of legitimacy, bases of authority, identity, attentional principles, temporal horizons, normative requirements, and resource dependencies.

Higher vocational colleges follow an institutionalised educational logic: legitimacy derives from fostering virtue and cultivating talent; authority is based on hierarchy and professional titles; temporal horizons are structured around academic years and semesters; core resources depend on government funding. Regional key industries follow a production-operational logic: legitimacy derives from market competition; authority is based on property rights and technical expertise; temporal horizons are dominated by product iteration cycles; core resources depend on capital and market share. When these two institutional logics interact in a cooperative field, tensions and conflicts inevitably arise.

### **3.2 Research Methods**

To deeply investigate the specific conflicts and negotiation mechanisms arising from differences between educational institutionalised logic and production-operational logic in industry-education integration practices between higher vocational colleges and regional key industries, this study adopted a qualitative case study design, selecting two higher vocational colleges in Jiangxi Province and their four deeply collaborating enterprises as the research field.

Following purposive and maximum variation sampling principles, and through referrals from college research offices and corporate HR departments combined with snowball sampling, 24 in-depth interview participants were ultimately identified. Among them, 12 participants came from higher vocational colleges and 12 from collaborating enterprises. The sample covered different hierarchical levels and various functions from educational administration to technical production, aiming to capture the diverse manifestations and coping strategies of institutional logic conflicts across different interfaces.

Data collection primarily employed semi-structured in-depth interviews, supplemented by documents including policy documents, meeting minutes, and project agreements. Interviews were conducted in two phases: Phase I used exploratory methods with open-ended questions based on the seven dimensions of institutional logics, identifying typical conflict scenarios through pilot interviews. Phase II revised and developed more focused in-depth interview protocols based on preliminary coding results from the pilot interviews. All interviews were conducted face-to-face or via online video, with full audio recording after obtaining informed consent. Each interview lasted 60 to 90 minutes to ensure sufficient time for in-depth dialogue. Interview recordings were transcribed verbatim, yielding approximately 150,000 words of raw interview data. All participant and institutional information was anonymised.

Data analysis employed thematic analysis using NVivo 12 qualitative data analysis software for systematic coding, categorisation, and management. The process comprised the following steps: First, open coding was conducted, line-by-line labelling of any statements related to logic differences, conflict manifestations, coordination efforts, or rule adjustments in the raw interview transcripts, generating initial codes. Second, axial coding was performed, clustering initially codes with similar meanings into more abstract themes, categorising them according to the seven dimensions of institutional logics while also attending to actor strategies. Through constant comparison of accounts from different interviewees and different conflict events, three core categories—conflict manifestations, negotiation strategies, and embedded outcomes—along with their subordinate themes were ultimately refined. Third, selective coding and integration were undertaken, using the "micro-dynamics of institutional logic conflicts" as the core storyline to systematically articulate the relationships among the three core categories, constructing a dynamic analytical framework of "contextualised conflict triggers (stemming from mismatches in logic elements) → strategic interactive negotiation (based on resource, discourse, and relationship gaming) → institutionalised embedding of conflict outcomes (forming new rules, temporary compromises, or legacy issues)." Throughout the analysis process, analytical memos were continuously written to document coding decisions, reflections on theme emergence, and theoretical connections, ensuring reflexivity and rigour.

## **4. Findings**

Based on systematic analysis of the interview data, three core themes were distilled: specific patterns of institutional logic conflicts, mechanisms of strategic interactive negotiation, and institutionalised embedding of conflict outcomes.

### **4.1 Specific Patterns of Institutional Logic Conflicts**

Interview data reveal that college-enterprise cooperation involves interaction and 磨合 between two types of actors following different operational rules. Conflicts are not abstract contradictions but rather mismatches across core elements of institutional logics, specifically manifesting in three dimensions: legitimacy, temporal horizons, and normative requirements.

#### **4.1.1 Conflicts in Sources of Legitimacy and Bases of Authority**

The legitimacy of college actors' actions is rooted in the "educational" mission and administrative directives, with authority based on hierarchical positions and professional titles. Enterprise legitimacy

is oriented toward "market efficiency" and "technological leadership," with authority based on property rights and core technical capabilities. An enterprise project manager stated directly: "School staff present documents specifying required instructional hours, but when we implement a technology upgrade, the entire process changes. Should we follow the document or the actual situation?" (E12)

#### ***4.1.2 Conflicts in Temporal Horizons***

The difficulty of synchronising "teaching rhythm" with "technology iteration speed" is evident. Higher vocational college teaching activities strictly follow a linear, predictable rhythm, while technology R&D and production in key industries follow a non-linear, pulsed rhythm of "market demand—technology iteration—project cycles." A department head explained: "We had just finalised the semester's enterprise practice plan in September when the enterprise's entire project focus changed in October due to new orders or technology roadmap adjustments." (S03)

#### ***4.1.3 Conflicts in Normative Requirements and Attentional Principles***

Educational logic requires teaching processes to be transparent and assessable, emphasising the holistic development of students' knowledge, skills, and competencies. Industrial logic, under competitive pressure, focuses intensively on core technology confidentiality and immediate returns. A faculty member involved in collaborative R&D noted: "We wanted to transform the process of solving real enterprise technical problems into teaching cases, but the enterprise would not agree to include parameters involving core confidentiality in public materials." (S11) From an attentional principle perspective, college faculty focus on students' long-term career growth, while enterprise mentors focus more on whether students can quickly perform specific job functions.

### ***4.2 Mechanisms of Strategic Interactive Negotiation***

Faced with these structural conflicts, actors on both college and enterprise sides have not passively accepted them but have developed a series of strategic interactions for negotiation.

#### ***4.2.1 Resource Exchange and Interest Bundling***

This strategy transforms "logic conflicts" into "cost-benefit calculations." When colleges need to arrange internships during enterprise peak production seasons, they may commit to providing additional "order class" enrolments or assistance with government research project applications as compensation. When enterprises request customised courses that exceed existing teaching standards, they often commit to providing training equipment or establishing scholarships. An enterprise mentor articulated the logic: "Pure reasoning makes progress difficult. What ultimately makes a deal work is both sides giving ground." (E04)

#### ***4.2.2 Rule Adaptation and Situational Exemptions***

Regarding the contradiction between core workshop confidentiality and student internships, negotiated solutions may include: excluding students from final assembly lines while establishing "teaching observation zones" in upstream process areas, or permitting practice within limited timeframes after signing stricter confidentiality agreements. For temporal conflicts, a common adaptation is "combining concentrated and distributed approaches," condensing a semester's worth of distributed practice hours into several weeks during the enterprise's relatively slack period. These ad hoc rules, in form, do not impact the overall legitimacy of either system.

#### ***4.2.3 Discourse Reconstruction and Meaning Attribution***

This strategy translates the language of industrial logic into objectives that educational logic can accept. For example, the enterprise need for "skilled operation of new equipment" is reframed as cultivating students' "advanced technology application capabilities" and "adaptation to industrial upgrading," thereby legitimising its inclusion in talent cultivation plans. A programme leader shared: "You can't just tell the teaching committee 'the enterprise needs this.' You have to elevate it: 'This is an industry development trend, necessary content for benchmarking against high-end industry and cultivating students' cutting-edge competitiveness.'" (S06)

### ***4.3 Institutionalised Embedding of Conflict Outcomes***

The outcomes of strategic interactions do not completely eliminate logic conflicts but become embedded in cooperation frameworks in different ways, forming new, hybrid practical orders primarily manifesting in three forms of embeddedness.

#### ***4.3.1 Formation of Stable "Interface Rules"***

Temporary solutions proven effective through repeated negotiation gradually solidify into default practices for both parties or are written into agreement appendices, becoming default institutions guiding subsequent similar cooperation. For example, one college-enterprise pair jointly formulated the "Implementation Rules for College-Enterprise Joint Projects," specifying student participation scope corresponding to different confidentiality levels and priority negotiation sequences for temporal conflicts—effectively an "adapter" between educational and industrial logics.

#### ***4.3.2 Inducement of Organisational "Marginal Adjustments"***

Some higher vocational colleges have reformed their teaching and research activity systems to accommodate industrial iteration, permitting "annual micro-adjustments" to professional teaching standards. Enterprises may adjust their internal training systems, front-loading some general pre-employment training into "order classes." These represent flexible expansions within existing logical frameworks.

#### ***4.3.3 Legacy of Unsolvable Structural Contradictions***

Conflicts involving enterprise core trade secrets persist as ongoing structural tensions. The strategy adopted by both parties is to demarcate boundaries, clearly defining "cooperation zones" and "restricted zones." This itself constitutes an institutionalised outcome, defining the practical boundaries of industry-education integration.

### **5. Conclusions and Optimisation Pathways**

#### ***5.1 Research Conclusions***

Through in-depth interviews with 24 key college and enterprise actors, this study systematically reveals the conflicts and negotiation mechanisms between higher vocational college educational institutionalised logic and regional key industry production-operational logic in micro-level interactions. The main conclusions are as follows:

Conflicts between the two types of logics are not abstract oppositions but concrete structural mismatches across dimensions including legitimacy authority, temporal horizons, and normative requirements. Among these, temporal conflicts between "teaching rhythm" and "technology iteration speed," along with normative conflicts between "teaching process transparency" and "core technology confidentiality," are particularly prominent and pervasive.

Actors demonstrate significant agency, developing three core strategic interactive negotiation mechanisms: resource exchange and interest bundling, rule adaptation and situational exemptions, and discourse reconstruction and meaning attribution.

Negotiation outcomes become embedded in cooperation frameworks to varying degrees through three modes—formation of stable interface rules, inducement of organisational marginal adjustments, and legacy of structural contradictions—thereby sustaining the dynamic survival and limited deepening of industry-education integration relationships.

These findings collectively validate and enrich this study's core analytical framework, namely that the deep practice of industry-education integration is a continuous dynamic process of "contextualised conflict triggers → strategic interactive negotiation → institutionalised embedding of conflict outcomes," profoundly revealing the micro-dynamics through which inter-organisational cooperation advances in an "institutionally complex" field.

#### ***5.2 Optimisation Pathway Recommendations***

##### ***5.2.1 For higher vocational colleges***

Institutions should abandon overly idealised expectations of industry-education integration, proactively identify and anticipate potential institutional logic conflicts, and cultivate the institutional negotiation capabilities of administrators and faculty. Colleges may establish dedicated industry-education integration coordination positions responsible for flexible alignment between academic calendars and enterprise project cycles. Additionally, periodic workshops on institutional logic differences should be organised to help faculty deeply understand the urgency of industrial

timelines and confidentiality requirements, thereby reserving space for subsequent negotiation at the curriculum design stage and avoiding reactive responses when conflicts intensively arise.

### 5.2.2 For enterprises

Enterprises in regional key industries should recognise that deep participation in industry-education integration constitutes a strategic investment in building long-term talent supply and technological innovation ecosystems. While safeguarding core commercial interests, enterprises should explore more flexible participation models aligned with educational principles. Within the bounds of non-disclosure of trade secrets, enterprises may designate specific areas open for teaching and establish anonymised case libraries, proactively alleviating tensions between confidentiality requirements and college teaching standards. Transforming some general technical content into shareable teaching resources can achieve both self-interest and cooperation efficiency.

### 5.2.3 For policy-making bodies

Evaluation focus should shift from merely assessing whether college-enterprise cooperation has been established to examining the development of conflict resolution mechanisms and the depth of integration development. Support should be provided for constructing cooperation platforms and governance structures capable of integrating and resolving institutional logic conflicts. Cases that successfully form interface rules or achieve marginal adjustments should receive policy preferences and financial incentives, guiding movement from "formal integration" toward "mechanistic integration." Establishment of industry-education integration conflict mediation mechanisms at the regional level should be encouraged, providing neutral negotiation support platforms for colleges and enterprises.

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