

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

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The problems arising from the combination of industry and education between higher vocational colleges and local important industries are due to the differences in the logical structure between the educational and industrial systems. By applying institutional logics theory as a research method, semi-structured interviews were given to 24 people from two higher vocational colleges and four enterprises, and then thematic analysis was carried out using NVivo. The findings show that there are substantial discrepancies in the legitimacy authority, temporal perspectives and normative standards of both sides. The participants negotiate continuously by exchanging resources, changing rules and reconstructing discussions. The results of their negotiations involve: interface rules, slight alterations or structural conflicts in the cooperation mechanisms. This study reveals the micro-processes of the combination of industry and education, namely "conflict occurrence-strategy negotiation-institutional integration", providing theoretical and practical suggestions for the improvement measures.

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

1. Introduction

Increasing the integration between industry and education is an important way to promote the high-quality development of higher vocational education. A well-connected system which integrates the 'education chain', 'talent chain', 'industrial chain' and 'innovation chain' has become an essential source of talents and technological support for the industrial reform and improvement. Nevertheless, although there are vigorous government policies, the existing difficulty of 'two separate systems' still exists in reality, showing superficial cooperation, inadequate precision in talent training, and poor technology transfer. The main problem is the structural contradiction between the operational mechanism of the educational system and the market-oriented and technology-driven logic of the industrial system, which has not been sufficiently revealed yet.

2. Literature Review

This investigation is centered on the conflicts and negotiation methods between the institutionalized educational logic and the production-operation logic of industry during the adjustment of higher vocational colleges to the key regional industries. Previous studies have discussed this fundamental problem from three aspects: the practical difficulties of integrating industry and education, the theoretical analysis of internal conflicts, and the exploration of improvement strategies, serving as a basis for this research.

2.1 Practical Dilemmas of Industry-Education Integration

Scholars emphasize the importance of "shallow integration" and the "two separate systems" phenomenon. From the viewpoint of the involved parties, the decreased willingness of enterprises to participate is a notable obstacle (Zheng & Qi, 2024). In addition, institutional capacity shortages (Yang et al., 2025) and limitations in faculty knowledge and service capability (Cui & Zhao, 2025) have been found to be important barriers. All these researches describe the various difficulties in

industry-education integration from the macro-level mechanism, meso-level stakeholders and micro-level capability perspectives, offering empirical background for understanding the conflicts of institutional logic.

2.2 Research on Institutional Logic Conflicts

The difficulties in integrating industry and education come from the different basic operating principles of the educational and industrial systems. Fang (2024) has pointed out the value discrepancies between colleges and enterprises from the viewpoint of a complex adaptive system. Xie et al. (2024), by analyzing the institutional self-assessment reports, have discovered that the transformation of the forms of industry-education integration, changing from "single virtual organizations" to "various practical organizations" in the management of professional clusters, needs further breakthrough, indicating the conflicts between the organizational management principle and the industrial cooperation principle. Wang and Shao (2023) have clearly put forward three internal demands: the industrial requirement principle, the talent training principle and the organizational operation principle. However, most of the above studies are still at the stage of identifying the principle types or analyzing the macro-scale contradictions.

2.3 Exploration of Optimisation Pathways and Mechanisms

Scholars have put forward optimization strategies and mechanisms from different viewpoints. Some stress the establishment of a system and model innovation, recommending that high-standard industrial and educational integration can form a new pattern of "point-driven coverage and chain-connected clusters" (Zhou & Yue, 2025). Li and Chi (2023) suggested a "scenario-driven" optimization model, proposing to expand the cooperation areas by means of demand scenarios. Concerning the operational mechanisms, Gao and Pei (2024) investigated the coupling development mechanisms of science-industrial and industry-educational integration under the "one coordination, three integrations" framework, which includes the goal, motive, coordination and guarantee mechanisms. Based on the symbiosis theory, Cao (2024) tried to build an integrated and mutually beneficial talent training system. Moreover, some studies have been concerned with the reform of the evaluation and incentive mechanisms (Jiang, 2023; Li & Chen, 2023).

Moreover, the previous studies have some drawbacks: (1) The viewpoints are mainly at a macro level and are relatively static, not providing a thorough investigation of the micro-level interaction procedures in daily collaboration. (2) The changeable 'conflict-negotiation' procedure has not been sufficiently disclosed, and there is not enough detailed study and theoretical improvement on how conflicts appear in particular incidents and the methods used to settle them. (3) Theoretical emphasis and contextual combination are not strong enough, unable to adequately consider the technological advancements and efficiency requirements of the major industries in the region when analyzing the conflicts with the talent training system of higher vocational colleges.

Therefore, this study is intended to fill these gaps by using institutional logics theory and qualitative research methods to thoroughly investigate the conflict patterns and dynamic negotiation procedures between higher vocational colleges and regional key industries in micro-level interaction areas, thus offering more contextual information and theoretical explanatory strength.

3. Research Design

3.1 Theoretical Framework

This research uses Institutional Logics Theory as the main analytical basis. It suggests that each institutional field has its own core logics, which include sources of legitimacy, bases of authority, identity, attentional principles, temporal perspectives, normative needs and resource dependencies.

Higher vocational colleges have an organised teaching principle: the legitimacy comes from moral education and talent training; the authority depends on the hierarchical order and the professional title; the time frames are arranged according to the academic terms and semesters; the main resources are supported by the government grants. In the regional major industries, the production-operation principle exists: the legitimacy results from commercial competition; the authority relies on the ownership rights and technical ability; the time scales are influenced by the product updating periods; the basic resources rely on the investment and market position. When these two institutional principles

work together in a cooperative sector, contradictions and disputes will occur inevitably.

3.2 Research Methods

To thoroughly examine the particular conflicts and negotiation processes occurring due to the discrepancies between the educational institutionalized logic and the production-operational logic in the industrial-vocational education integration between higher vocational colleges and the local key industries, a qualitative case study was conducted, choosing two higher vocational colleges in Jiangxi Province and their four closely cooperating enterprises as the study area.

According to purposive and maximum variation sampling methods, and by means of referrals from college research sections and corporate Human Resources departments together with snowball sampling, 24 in-depth interview subjects were finally selected. Among these, 12 subjects were from higher vocational colleges and the other 12 from the cooperating enterprises. The sample includes different ranks and various positions from educational administration to production techniques, in order to reflect the diversified manifestations and adjustment strategies of institutional conflict at different levels.

Data collection mainly adopted semi-structured in-depth interviews, together with documents such as policy documents, meeting minutes and project agreements. The interviews were carried out in two stages: In the first stage, exploratory methods were applied with open-ended questions according to the seven dimensions of institutional logics, and typical conflict situations were discovered through pilot interviews. In the second stage, more specific in-depth interview schemes were modified and improved basing on the preliminary coding results from the pilot interviews. All the interviews were conducted either in person or by video conferencing, and the conversations were recorded fully after getting the consent. Each interview lasted from 60 to 90 minutes to guarantee adequate time for detailed discussion. The interview records were transcribed word for word, producing about 150,000 words of original interview material. All the personal and institutional data were de-identified.

Data analysis used thematic analysis with NVivo 12 qualitative data analysis software for systematic coding, categorization and management. This process included the following stages: Firstly, open coding was done, assigning labels to each statement containing information about logical differences, conflict manifestations, coordination efforts or rule adjustments in the original interview records, and producing initial codes. Secondly, axial coding was carried out, grouping the initial codes with the same meanings into more generalized themes and classifying them based on the seven dimensions of institutional logics while also considering the strategies of the actors. By comparing the accounts of different interviewees and various conflict events, the three main categories -- conflict manifestations, negotiation strategies and embedded results -- together with their sub-themes were finally clarified. Then, selective coding and integration were performed, taking "micro-level conflicts of institutional logics" as the main storyline to systematically describe the relations between the three main categories, and forming a dynamic analytical framework of "contextualized conflict triggers (resulting from the inconsistency of logic elements) → strategic interactive negotiations (based on the utilization of resources, discourse and relational games) → institutionalized embedding of conflict outcomes (establishing new rules, temporary compromises or legacy problems)". During the analysis process, analytical notes were continuously written to record the coding decisions, the emergence of themes and the theoretical connections, in order to achieve reflexivity and rigor.

4. Findings

According to a thorough examination of the interview data, three main themes have been extracted: the particular patterns of institutional logical contradictions, the procedures of strategic mutual negotiations and the institutionalization of the results of conflicts.

4.1 Specific Patterns of Institutional Logic Conflicts

Interview results show that college-enterprise cooperation includes interaction and adjustment between two groups with different operating procedures. Conflicts are not mere conceptual contradictions, but rather discrepancies in the fundamental components of institutional logics, particularly in three aspects: legitimacy, time perspectives and normative standards.

4.1.1 Conflicts in Sources of Legitimacy and Bases of Authority

The authenticity of the college actors' behaviors is related to the "educational" goal and the administrative instructions, with authority determined by their hierarchical ranks and professional titles. The enterprise legitimacy is based on "market efficiency" and "technological advancement," and authority is decided by the property rights and core technological skills. An enterprise manager said clearly: "When school staff present documents indicating the necessary teaching hours, however, during a technological modification, the whole procedure varies. Should we obey the document or consider the actual condition?" (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 method converts "logical contradictions" into "discussions on cost and advantage." If the enterprises are occupied, the colleges might admit more "order class" students or help them apply for government research projects as a substitute. When the enterprises require some special courses which are not included in the present teaching specifications, they usually provide training conditions or set up scholarships. One enterprise teacher stated, "The advancement depends on the view of one side, but the realization of an agreement depends on the compromises of both sides." (E04)

4.2.2 Rule Adaptation and Situational Exemptions

Regarding the contradiction between the main workshop's confidentiality and the students' internships, some solutions could be: not letting the students take part in the final assembly line but establishing "observation zones" in the upstream processing sections, or allowing them to have practice within particular time periods after signing stricter confidentiality agreements. For the schedule issue, a common way is to mix the intensive practice with the scattered one, reducing the total scattered practice time of a semester to a few weeks when the enterprise has less work. These provisional rules do not influence the correctness of either system.

4.2.3 Discourse Reconstruction and Meaning Attribution

This strategy changes the language of industrial logic into objectives acceptable to educational logic. For instance, the requirement of the enterprise for "skilled operation of new equipment" is redefined as improving students' "advanced technology application abilities" and "ability to adapt to industrial improvement", thus making it valid for inclusion in the talent training plan. A programme leader said, "You cannot simply state to the teaching committee 'the enterprise requires this.' You should raise it to a level: 'This is an industry development trend, essential content for comparison with high-standard industries and enhancing students' advanced 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 Unsolvability 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:

Contradictions between the two kinds of logics are not merely abstract oppositions but actual discrepancies in structure covering dimensions such as legitimacy, temporal perspectives and normative requirements. Among them, the temporal conflicts between "teaching rhythm" and "speed of technological change" as well as the normative conflicts between "transparency of teaching process" and "confidentiality of core technology" are significant and widespread.

Actors exhibit considerable agency, forming three main strategic interaction negotiation procedures: resource sharing and interest combination, rule modification and contextual exceptions, and discourse restructuring and interpretation of meaning.

Negotiation results are incorporated into the cooperation systems to different extents via three ways—establishment of stable interface regulations, prompting organizational minor changes, and inheritance of structural conflicts, thus maintaining the fluctuating development and partial advancement of industrial-educational integration relationships.

These results confirm and supplement the main analytical model of this study, which is that the deep integration between industry and education is a continual and changing process including "contextualized conflict triggers → strategic interactional negotiation → institutionalization of conflict results," clearly showing the micro-processes by which inter-organizational cooperation develops in a "complex institutional" environment.

5.2 Optimisation Pathway Recommendations

5.2.1 For higher vocational colleges

Institutions ought to give up the unrealistic hopes of perfecting the combination of industry and

education, and should actively find and predict possible contradictions within the institutional logic. At the same time, they should enhance the institutional negotiation abilities of both administrators and teachers. Colleges can set up special positions for coordinating industry-education integration, which is responsible for adjusting the academic schedules flexibly with the enterprise project cycles. Moreover, regular workshops concerning differences in institutional logic should be held to assist the teachers in realizing the importance of industrial time tables and the necessity of confidentiality, so as to provide opportunities for negotiation during the curriculum designing stage and prevent sudden reactions when conflicts become more severe.

5.2.2 For enterprises

Companies in important industries need to realize that active participation in industry-education combination is an important investment in establishing a stable talent source and technological innovation system. Although they should protect their main commercial interests, they should also investigate various flexible participation methods which are consistent with educational principles. Under the condition of not disclosing trade secrets, companies can set certain parts to be used for teaching and set up anonymous case libraries, thus reducing the conflict between the confidentiality needs and the requirements of college teaching. By converting some common technical contents into shared teaching materials, both individual benefits and cooperation efficiency can be achieved.

5.2.3 For policy-making bodies

Evaluation should be changed from simply judging the establishment of college-enterprise cooperation to evaluating the improvement of conflict resolution systems and the extent of integration. Assistance should be given for building cooperation bases and governing frameworks which can promote and solve institutional conflicts. Those cases which can establish interaction rules or make minor adjustments should be preferred in policy and receive financial encouragement, leading to the transition from "formal integration" to "mechanistic integration." It is advisable to set up regional conflict adjustment mechanisms for industry-education integration, and provide impartial negotiation support platforms for colleges and enterprises.

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