

Research on the Path of Characteristic Industrial Colleges Empowering Key Elements of Vocational Education under Multiple Institutional Logics

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Abstract: Characteristic industrial colleges represent a pivotal institutional innovation in China's vocational education reform, yet their capacity to empower the five key teaching elements-specialty programs, curricula, textbooks, teaching staff, and practical training-remains theoretically underexplored. Drawing on the multiple institutional logics perspective, this study constructs an analytical framework encompassing governmental, market, educational, and corporate logics to examine how these competing yet complementary logics interact within industrial colleges and shape their empowerment pathways. Through systematic case analysis of 30 characteristic industrial colleges across China, the study identifies four modes of logic interaction-conflict, translation, coupling, and synergy-and delineates five corresponding empowerment pathways. The findings reveal that the core mechanism of empowerment lies in the industrial college's function as a "logic translator," converting corporate and market demands into educationally viable reforms. The paper concludes with a progressive strategy framework-from interest-driven cooperation to institution-locked partnership-for achieving sustainable empowerment of vocational education key elements.

1. Introduction

The industrial college has emerged as one of the most significant institutional innovations in China's vocational education landscape over the past two decades. A 2023 survey by the Ministry of Education's Vocational Education Development Center found that the majority of higher vocational institutions had established industrial colleges, with surveyed institutions averaging five industrial colleges each [1]. Since the concept was first formalized in the State Council's Several Opinions on Deepening the Integration of Industry and Education (2017), this model has proliferated rapidly [2]. The Ministry of Education's Guidelines for the Construction of Modern Industrial Colleges (2020) further elevated this model to a national strategy, defining them as "exemplary talent-cultivation entities co-built and co-governed by universities, local governments, and industry enterprises" [3].

In 2025, the Ministry of Education further differentiated industrial colleges into three subtypes—modern industrial colleges, specialty discipline colleges, and rural revitalization colleges—and launched the first batch of national demonstration characteristic colleges, signaling a strategic shift from quantitative expansion to qualitative improvement [4].

Despite this momentum, a critical question remains unresolved: how can industrial colleges effectively empower the reform of vocational education's key teaching elements? In February 2026, the Ministry of Education issued the *Opinions on Deepening the Reform of Key Elements of Vocational Education Teaching* (Document No. 1 [2026]), explicitly identifying five interconnected key elements—specialty programs, curricula, textbooks, teaching staff, and practical training—as the foundation for cultivating high-skilled talent [5]. The document emphasizes systematic, coordinated reform rather than isolated efforts. However, existing research on industrial colleges has predominantly focused on descriptive case studies of governance models and partnership mechanisms, with limited theoretical engagement with the underlying institutional dynamics that enable or constrain reforms across these five domains [4,5].

This study addresses this gap by introducing the multiple institutional logics perspective as an analytical framework. Originating from the seminal work of Friedland and Alford (1991) and further developed by Thornton, Ocasio, and Lounsbury (2012), this perspective posits that organizational fields are shaped by multiple, often contradictory, institutional logics—each providing distinct principles, practices, and criteria for legitimacy [6,7]. In the Chinese context, Zhou (2017) has demonstrated the analytical power of multiple logics in understanding institutional change within China's unique governance structure [6]. Characteristic industrial colleges operate at the intersection of governmental logic (policy compliance, standardization), market logic (efficiency, demand-responsiveness), educational logic (holistic human development, pedagogical integrity), and corporate logic (skill specificity, immediate productivity), making them ideal sites for examining how competing institutional logics shape organizational outcomes.

This paper poses three research questions: (1) What institutional logics operate within characteristic industrial colleges, and how do they interact? (2) Through what mechanisms do these interacting logics enable or constrain the empowerment of the five key teaching elements? (3) What strategies can optimize the synergy among multiple logics to achieve sustainable empowerment? To answer these questions, we conduct a systematic analysis of 30 characteristic industrial colleges drawn from China's first group of vocational universities and high-level higher vocational institutions, integrating documentary evidence, institutional reports, and publicly available case materials.

2. Literature Review and Theoretical Framework

2.1. Evolution and Current State of Characteristic Industrial Colleges

The development of industrial colleges in China can be traced through four distinct phases: the embryonic exploration period (2007–2012), the model expansion period (2013–2017), the policy establishment period (2017–2020), and the deepening reform period (2020–present). Ding (2025) provides the most comprehensive theoretical treatment to date, defining modern industrial colleges as "a new form of college organization that takes industrial development needs as the inherent logic of organizational structure, achieved through innovations in knowledge operation and organizational operation" [7]. The China Education Development Strategy Association's group standard further distinguishes characteristic industrial colleges by their focus on regional specialty industries and their integration of talent cultivation, scientific research, and enterprise services [8].

In empirical research, Li and Cheng (2026), drawing on symbiosis theory, analyzed the challenges facing modern industrial colleges and proposed a systematic optimization strategy

encompassing resource integration, stakeholder empowerment, policy coordination, and pedagogical reform [9]. Pan et al. (2025) systematically reviewed the research and practice of industry-education integration in 2024, highlighting the "one body, two wings" framework-with industry-education communities and city-level consortia as the core institutional carriers-and noting the deepening integration of educational and industrial chains across governance models [10]. Zeng (2023) provided a nationwide survey-based diagnosis, identifying key challenges including ambiguous legal status, insufficient enterprise participation depth, and the lack of clear benefit-sharing mechanisms [1]. However, these studies tend to treat industrial colleges as organizational solutions rather than examining the institutional tensions embedded within them.

2.2. The Five Key Teaching Elements of Vocational Education

The Ministry of Education's 2026 reform guidelines provide the most authoritative articulation of the five key elements: (1) Specialty programs-the establishment of a "three-list" mechanism (urgently needed, upgrading, restricting/withdrawing) for dynamic program adjustment; (2) Curricula-the development of competency maps and the promotion of integrated, modular, and project-based course structures; (3) Textbooks-the adoption of a "triple editor-in-chief" mechanism (enterprise expert, academic lead, industry authority) for developing loose-leaf, workbook-style, and digital textbooks; (4) Teaching staff-the establishment of industry mentor systems and bidirectional talent flow between institutions and enterprises; and (5) Practical training-the construction of industry-education integrated training bases using shareholding and mixed-ownership models [5]. These five elements are characterized by systemic interdependence: program setup defines the entry point, curricula and textbooks serve as carriers, teaching staff provides the driving force, and practical training acts as the implementation venue.

2.3. Multiple Institutional Logics as Analytical Framework

Friedland and Alford (1991) originally proposed that Western societies are composed of distinct institutional orders-the capitalist market, the bureaucratic state, democracy, the nuclear family, and Christianity-each governed by a central logic that constitutes its organizing principles [11]. Thornton et al. (2012) systematized this perspective, defining institutional logics as "the socially constructed, historical patterns of cultural symbols and material practices, including assumptions, values, and beliefs, by which individuals and organizations provide meaning to their daily activity, organize time and space, and reproduce their lives and experiences" [12]. Scott (2014) provided a complementary framework by distinguishing three pillars of institutions: regulative, normative, and cultural-cognitive [13].

Zhou (2017) adapted this framework to the Chinese context, demonstrating how multiple institutional logics-particularly the tension between bureaucratic governance and market mechanisms-shape organizational behavior in China's unique political-economic system [6]. Extending this inquiry to vocational education, we identify four primary logics operating within characteristic industrial colleges: (a) Governmental logic, emphasizing policy compliance, standardized evaluation, and performance accountability; (b) Market logic, prioritizing efficiency, demand-responsiveness, and cost-benefit calculation; (c) Educational logic, centering on holistic human development, knowledge integrity, and pedagogical appropriateness; and (d) Corporate logic, focusing on job-specific competency, immediate productivity, and protection of core technologies. These four logics coexist within each industrial college, but their relative salience and interaction patterns vary significantly across institutional contexts, partnership configurations, and developmental stages.

3. Multiple Institutional Logics in the Operation of Characteristic Industrial Colleges

3.1. Identification of Actors and Their Dominant Logics

Characteristic industrial colleges involve a diverse array of stakeholders, each guided by distinct institutional logics. Central and local governments operate primarily under governmental logic, seeking to advance national strategies for skilled workforce development while maintaining oversight through accreditation and evaluation mechanisms. Higher vocational institutions embody educational logic, prioritizing student development, curriculum coherence, and academic standards, though they must also navigate governmental performance metrics. Partner enterprises-ranging from industry leaders like Huawei and BYD to regional small and medium-sized enterprises-are driven by corporate logic, valuing the immediate availability of job-ready graduates and access to institutional research capabilities. Industry associations and chambers of commerce operate at the intersection of market and governmental logics, facilitating coordination while representing collective industry interests. Students and their families embody a user logic, seeking employability and career advancement through quality education.

3.2. Logic Conflicts and Tensions

The coexistence of multiple logics generates several characteristic tensions. First, governmental logic and educational logic may conflict when standardized evaluation frameworks constrain institutional autonomy in program design-the "three-list" mechanism, while ensuring alignment with national priorities, can limit the agility needed to respond to emerging industries such as embodied intelligence and the low-altitude economy. Second, corporate logic and educational logic exhibit a fundamental tension between short-term skill specificity and long-term human development. The prevalent "order-form class" (dingdan ban) model, in which enterprises commission training for specific positions, risks narrowing students' adaptive capacity beyond a single employer. Third, market logic and governmental logic may be misaligned when the pace of industrial change-driven by technological disruption-outpaces policy adjustment cycles. Fourth, differential power among enterprises creates internal frictions: leading enterprises may capture disproportionate benefits, while smaller enterprises in industrial clusters struggle to exert influence on curriculum and program design [1].

3.3. Logic Coupling and Synergy

Our analysis reveals a progressive spectrum of logic integration, operationalized through partnership mechanisms of increasing depth. At the most basic level, education-empowerment cooperation maintains clear boundaries between educational and corporate logics, with enterprises providing resources to teaching activities without deep organizational integration. Deep-binding cooperation, as exemplified by the Beijing Jingdiao College at Nanjing Polytechnic University-where the enterprise's Nanjing branch physically relocated to campus with eight resident engineers and annual production-training projects exceeding one million RMB-represents a higher degree of logic coupling. Non-equity mixed ownership arrangements, as seen in the Muliinsen College at Ji'an Vocational and Technical College, involve substantial joint investment (approximately 70 million RMB from the enterprise and 10 million from the institution) within a non-legal-person framework. At the most integrated level, equity-based mixed ownership creates legal entities with shared governance, as practiced by the Intelligent Precision Manufacturing Education Park at Jinhua Polytechnic University, which has established five joint ventures integrating production, teaching, and research.

The organizational governance of industrial colleges reflects a parallel evolution. Most adopt a dean responsibility system under a council or board of directors, with innovations such as the "four-rights separation" (ownership, management, usage, and benefit rights) pioneered by Chongqing Science and Technology Vocational College, providing institutional safeguards for balancing multiple stakeholder logics. The emergence of national-level industry-education integration communities and city-level consortia, as documented by Pan et al. (2025), provides upper-layer institutional infrastructure that reduces coordination costs for individual industrial colleges [10].

4. Empowerment Pathways for the Five Key Teaching Elements

4.1. Empowering Specialty Programs: From Industry Alignment to Industry Leadership

Under the combined influence of governmental planning logic (the "three-list" mechanism) and market signaling logic (industry demand data), characteristic industrial colleges function as "industry-demand sensors" that dramatically shorten the response cycle for program adjustment. Shenzhen Polytechnic University's evolutionary trajectory—from the Huawei ICT College in 2014 through the DJI Drone College in 2023 to the UBTECH Embodied Intelligence Industrial College in 2026—exemplifies how industrial colleges enable institutions to not merely align with but anticipate and lead industrial transformation. At Jinhua Polytechnic University, the Wuyi Advanced Manufacturing College integrates programs across the entire Yongkang hardware industrial cluster, implementing a "secondary vocational foundation-higher vocational skill enhancement-industrial empowerment" tri-level cultivation system that embeds program design within regional industrial ecosystems. This regionally-embedded model is recognized as an exemplary case of county-level industry-education integration serving local industrial clusters [10].

4.2. Empowering Curricula: From Discipline-Centered to Competency-Centered

The interaction between corporate job logic and educational developmental logic drives the transformation of curricula toward project-based, modular, and virtual-real integrated structures. The Beijing Jingdiao College exemplifies the project-based approach, converting authentic enterprise machining projects into curriculum content. Yangzhou Polytechnic University's New Energy Vehicle Industrial College implements a "simulated-contextual-authentic" three-stage pedagogical progression. The widely-adopted "shared foundation-intermediate integration-advanced elective" three-tier curriculum architecture enables both depth in specialized competencies and breadth in adaptive capabilities, mediating between corporate demands for specificity and educational commitments to versatility. As Ding (2025) argues, this curriculum architecture represents a crucial mechanism for reconciling the inherent tension between the logic of industrial production and the logic of educational development [7].

4.3. Empowering Textbooks: From Knowledge Repositories to Industry-Education Media

The "triple editor-in-chief" mechanism—involving enterprise technical experts, institutional subject leaders, and industry authority figures—operationalizes the fusion of corporate technical logic (codification of industrial standards) and academic knowledge logic (systematization of disciplinary knowledge). Shenzhen Polytechnic University's collaboration with Huawei produced the Cangjie Programming Technology and Application digital textbook, recognized as a national-level digital textbook and disseminated internationally. The Beijing Jingdiao College's Precision Machining of New Energy Vehicle Scroll Compressors exemplifies the loose-leaf workbook format, transforming production tasks into modular teaching units that can be updated asynchronously with technological

advances. These innovations directly implement the MOE's 2026 mandate for diversified textbook formats including loose-leaf, workbook-style, and digital materials [5].

4.4. Empowering Teaching Staff: From Dual-Qualification to Bidirectional Mobility

The empowerment of teaching staff represents perhaps the most direct manifestation of logic coupling, as it requires physical movement of personnel across institutional boundaries. The Beijing Jingdiao College's deployment of eight full-time resident engineers for continuous on-campus teaching embodies corporate logic's penetration into the educational domain. Conversely, the "PhD-in-residence" mechanism at institutions such as Nanjing Polytechnic University's Suhao Industrial College places young faculty members in enterprise settings for extended practical training. At Muliinsen College, Ji'an Vocational and Technical College, the enterprise dispatched 60 technical specialists to serve as instructors, representing one of the largest-scale instances of industry-to-education personnel transfer. These bidirectional mobility arrangements create what we term "boundary-spanning human capital"-professionals capable of navigating and translating between the distinct logics of education and industry [3, 4].

4.5. Empowering Practical Training: From Simulated Exercises to Authentic Production

The evolution of practical training environments-from on-campus simulation laboratories to enterprise branches relocated to campus, from scaled-down teaching production lines to equity-based joint-venture training entities-charts a progressive integration of corporate production logic with educational sequencing logic. The Beijing Jingdiao College's relocation of its Nanjing branch entirely onto campus, with annual production-training projects exceeding one million RMB, represents the most comprehensive model of authentic-environment integration. At Yunnan Mechanical and Electrical Vocational College, the Civil Aviation Technology Industrial College operates through a mixed-ownership joint venture (institution holding 67%, enterprise 33%), aligning financial incentives with training quality. These cases demonstrate that as the institutional mechanism deepens-from non-equity cooperation to equity-based mixed ownership-the authenticity and sustainability of practical training correspondingly increase. This finding aligns with Li and Cheng's (2026) symbiosis theory perspective that deeper resource integration mechanisms are essential for overcoming organizational boundaries in industry-education partnerships [9].

4.6. Systemic Relationships Among the Five Elements

The five key elements constitute an interdependent system rather than independent domains. Specialty programs define the strategic entry point; curricula and textbooks provide content carriers; teaching staff serves as the driving engine; and practical training constitutes the implementation site. The characteristic industrial college functions as an "element integrator," translating diverse institutional logics into coordinated reforms across all five domains simultaneously. This systemic function distinguishes industrial colleges from fragmented partnership arrangements-such as ad hoc enterprise guest lectures or occasional internship placements-that address individual elements without generating systemic transformation. The MOE's 2026 reform guidelines explicitly recognize this interdependence, mandating coordinated reform that follows the intrinsic logic of professional, curricular, textbook, faculty, and practical training linkages [5].

5. Strategies for Optimizing Logic Synergy toward Sustainable Empowerment

5.1. Mechanism Design: From Interest-Driven to Institution-Locked Cooperation

Sustainable empowerment requires a progressive strategy for deepening partnership mechanisms. Institutions should design cooperation pathways that allow for graduated deepening: beginning with non-equity deep-binding arrangements that build trust and demonstrate mutual value, then transitioning toward conditional mixed-ownership structures when organizational readiness and regulatory frameworks permit. The key insight is that institutionalization-embedding cooperation in formal governance structures, legal agreements, and shared asset ownership-reduces vulnerability to personnel changes and short-term interest fluctuations. The 2023 national Implementation Plan for Empowering and Upgrading Industry-Education Integration provides policy frameworks for such progressive deepening, including "financial + fiscal + land + credit" combined incentive measures [14].

5.2. Organizational Governance: From Hierarchical Management to Flexible Governance

The council/board governance model should be substantively operationalized rather than remaining ceremonial. Innovations such as the "four-rights separation" mechanism provide institutional tools for balancing stakeholder interests. The emergence of industry-education integration communities at the national level and city-level industry-education consortia-the "two wings" of China's current industry-education integration architecture [10]-provides essential upper-layer institutional infrastructure. Dynamic organizational structures, such as specialized working groups for curriculum reform or technology transfer, enable the flexibility required to respond to rapid industrial change while maintaining stable governance frameworks. The 2022 national guideline on modernizing the vocational education system explicitly called for innovative governance mechanisms in school-enterprise co-constructed entities [15].

5.3. Industrial Engagement: From Singular Alignment to Ecosystem Embedding

Analysis of 30 characteristic industrial colleges reveals three developmental trajectories: leading-enterprise-driven models (14 cases), industrial cluster collaboration models (8 cases), and industry-education ecosystem models (8 cases). These represent not merely alternative configurations but progressive stages of industrial engagement. Leading-enterprise partnerships offer depth but risk dependency; cluster collaborations offer breadth but face coordination challenges; ecosystem models offer sustainability but require substantial institutional capacity. The strategic imperative is to design a phased pathway: beginning with deep engagement with a lead enterprise to establish operational competence, expanding to cluster-level collaboration to increase resilience, and ultimately evolving toward ecosystem integration for long-term sustainability. This graduated approach resonates with the NDRC's 2023 implementation plan's call for building multi-tiered industry-education integration platforms [14].

5.4. Entrepreneurship Cultivation: From Skill Training to Sustainable Development Capacity

Entrepreneurship education represents an emerging dimension of industrial college functionality that integrates multiple logics in a distinctive configuration. Four models are identifiable: special-fund-driven incubation (exemplified by Shandong Electronics Vocational College's rural entrepreneurship fund), closed-loop ecosystem construction (Suzhou Jianxiong Vocational College's "learning-practice-incubation-monetization" cycle for AIGC digital arts), ecosystem-platform

approaches (Chongqing Science and Technology Vocational College's three-tier incubation system), and post-course-certificate-competition-research-entrepreneurship integration (Hainan Vocational University of Science and Technology's public entrepreneurship incubation base). These models extend the industrial college's empowerment function from immediate employability to long-term career agency, addressing the deepest tension between corporate logic (immediate productivity) and educational logic (lifelong development capacity).

6. Conclusion

This study has employed the multiple institutional logics perspective to analyze how characteristic industrial colleges empower the five key teaching elements of vocational education. The central finding is that the empowerment process is fundamentally a logic-coupling phenomenon: industrial colleges function as institutional spaces where governmental, market, educational, and corporate logics intersect, conflict, and under favorable conditions achieve productive synergy. The effectiveness of empowerment is determined not by the dominance of any single logic but by the quality of translation mechanisms that convert cross-domain demands into educationally viable reforms.

The study's theoretical contribution lies in extending the multiple institutional logics framework to the vocational education domain and articulating the specific mechanisms through which logic interaction shapes organizational outcomes. The practical implication is a graduated strategy framework: from interest-driven cooperation to institution-locked partnership, from hierarchical management to flexible governance, and from singular enterprise alignment to ecosystem embedding. This framework provides actionable guidance for vocational institutions seeking to maximize the transformative potential of their industrial college partnerships.

Several limitations should be acknowledged. The study's empirical base is drawn primarily from well-resourced vocational universities and institutions in China's developed coastal regions; the applicability of the framework to smaller, less-resourced institutions in central and western regions requires further investigation. The analysis relies on documentary evidence and publicly available case materials rather than primary interview or survey data on stakeholder perceptions. Future research should pursue quantitative measurement of logic weights and coupling effects across different institutional contexts, and longitudinal studies tracing the evolution of logic configurations through developmental stages of industrial colleges. Comparative international research-examining analogous models such as Germany's learning factories, Singapore's SkillsFuture initiative, or Australia's industry Skills Councils-could further enrich the theoretical generalizability of the multiple logics perspective in vocational education governance.

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