

Research on Collaborative Governance of School-Enterprise Cooperation in Undergraduate Vocational Education—A Case Study of Characteristic Industrial Colleges of Shenzhen Polytechnic University

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Undergraduate vocational education in China plays a central role in cultivating high-level technical and skilled talents and underpinning the development of new quality productive forces. School-enterprise cooperation is a key pathway to the high-quality development of undergraduate vocational education, yet faces practical challenges. Using collaborative governance theory as an analytical framework, this paper systematically explores the operation, practical challenges and possible solutions of school-enterprise cooperation in undergraduate vocational education. It examines characteristic industrial colleges at Shenzhen Polytechnic University, analyzes its collaborative governance practices and outcomes in objectives, stakeholders, and mechanisms of school-enterprise cooperation, and offers theoretical insights and practical implications for advancing the high-quality development of undergraduate vocational education.

Keywords: undergraduate vocational education, school-enterprise cooperation, collaborative governance, characteristic industrial colleges

Against the backdrop of high-quality economic and social development in China, the demand for high-level technical and skilled talents continues to grow. Undergraduate vocational education plays an increasingly important role in linking vocational and general education and supporting industrial transformation and upgrading. The newly revised *Vocational Education Law of China* in 2022 explicitly establishes the dual-subject status of schools and enterprises, providing legal safeguards for school-enterprise cooperation in undergraduate vocational education. The Ministry of Education launched the First Phase National High-Vocational Institution Development Program in 2019. After accomplishing its targets, the Second Phase National High-Vocational Institution Development Program was initiated in 2025, further emphasizing “high-standard school-running capacity and high-quality integration of industry and education”, and promoting deeper school-enterprise integration in undergraduate vocational education.

Practical Dilemmas Confronting School-Enterprise Cooperation in Undergraduate

Vocational Education

Tensions persist between vocational education and industrial development, and school-enterprise cooperation in undergraduate vocational education still faces three main problems.

Misaligned Governance Goals

Conflicts of interest exist between vocational colleges and enterprises, as the two parties hold divergent interest orientations (Lin, Cheng, & Xu, 2024), leading to the prevalent problem of excessive school dominance and insufficient enterprise participation. As a public welfare educational entity, undergraduate vocational institutions center on talent cultivation, aiming to cultivate highly skilled professionals with broad competencies and prioritizing overall educational outcomes. Enterprises, as market-oriented business entities, take economic benefits as their core orientation. “As for-profit organizations, although enterprises bear social service responsibilities, their primary objectives remain maximizing self-interests and efficient wealth accumulation” (Zheng & He, 2025, pp. 15-24).

Unclear Stakeholder Roles and Responsibilities

The division of rights and obligations among stakeholders remains ambiguous in current school-enterprise cooperation of undergraduate vocational education. “The fundamental reason why numerous previous school-enterprise cooperation activities fail to realize industry-education integration lies in the lack of clear definition of rights and obligations of each stakeholder. Ambiguous inter-subject relations trigger cooperation obstacles and hinder the advancement of school-enterprise cooperation” (Huang, 2019), giving rise to frequent phenomena of “absence, misalignment and overstepping of duties”.

From the government’s perspective, some local governments intervene excessively in the specific operation of school-enterprise cooperation through administrative directives, overstepping their authority and ignoring the institutional autonomy of higher vocational institutions and the status as market actors of enterprises. The supporting policies issued lack targeted design and effective implementation, creating gaps in policy implementation. Preferential taxation, fiscal subsidies, land supply, financial support and other incentives remain accessible only on paper rather than in practice.

From the institutional perspective, as key institutions for cultivating highly skilled professionals, certain undergraduate vocational institutions cling to a school-centered approach to education, dominating the whole talent cultivation process and weakening the role of enterprises as equal partners in collaborative education, which disconnects talent supply from actual industrial demands.

From the enterprise perspective, enterprises lack clear rights and obligations in talent cultivation, and have little meaningful decision-making authority in teaching evaluation, joint faculty development and practical training arrangement. They also harbor concerns over returns on resource investment and commercial confidentiality.

From the industry association perspective, their bridging function linking education and industry has not been fully exerted, with inadequate participation that impedes the effective alignment of teaching standards and occupational competency standards.

Fragmented Governance Mechanisms

Current mechanisms for school-enterprise cooperation in undergraduate vocational education remain fragmented and lack systematic, routine mechanisms for sustained coordination. The policies for vocational

school-enterprise cooperation suffer from weak overall coherence, poor cross-sector coordination, limited operability, and inadequate incentives for enterprises (Zhao, 2018).

First, imperfect decision-making and implementation mechanisms. Major school-enterprise cooperation matters are mostly decided unilaterally by schools with limited enterprise participation, rendering decisions unable to fully accommodate industrial demands. The absence of collaborative supervision in policy implementation makes many cooperative projects difficult to implement effectively, failing to sustain the educational efficacy of industry-education integration.

Second, flawed coordination and evaluation mechanisms. Communication between schools and enterprises mostly relies on temporary, ad-hoc exchanges without institutionalized and regular communication platforms. Evaluation is school-dominated, excluding enterprises, industry associations and third-party institutions. Evaluation criteria overemphasize theoretical academic achievement while neglecting occupational competencies, technological research and practical capabilities, weakening the guiding function of evaluation.

Third, barriers to resource integration. Undergraduate vocational institutions belong to the public education system defined by public welfare and educational attributes, while enterprises fall within the market industrial system featured by profitability and market attributes. Natural barriers exist between the two systems in resource attributes and circulation logic, hindering resource integration. In addition, traditional diploma-oriented culture breeds cognitive bias against vocational education, resulting in insufficient public recognition of vocational education.

The Value of Collaborative Governance for Vocational Education

Core Connotations of Collaborative Governance Theory

Derived from synergetics and public governance theory, collaborative governance emphasizes that multiple stakeholders including governments, markets, social organizations and institutions pursue shared goals, and achieve system-level effectiveness unattainable by individual entities through equal participation, consultative interaction, resource integration, benefit sharing and risk pooling. Collaboration goes beyond simple cooperation; it involves complementary and coordinated action among multiple stakeholders and factors around shared innovation goals, essentially representing an institutional innovation in management (Li, 2021). The theory integrates the core idea of synergetics that systems form ordered structures through self-organization, as well as the governance logic highlighting multi-stakeholder participation from governance theory.

The Commission on Global Governance defines collaborative governance as “the sum of diverse ways through which individuals and public or private institutions administer their common affairs. It is a continuous process reconciling conflicting interests and prompting joint actions, encompassing both formal legally binding rules and informal institutional arrangements facilitating consultation and reconciliation” (Zheng & He, 2025, pp. 15-24). Its strengths lie in “open administrative systems, diversified action strategy portfolios, adaptable cultural and institutional structures, innovative networked organizations and effective social coordination mechanisms” (Chen, 2022).

Collaborative Governance of School-Enterprise Cooperation in Undergraduate Vocational Education

As China’s educational modernization enters a new stage, collaborative governance in education gains growing importance. This is because educational modernization in the new era lays greater stress on integrated development and co-construction and sharing. Integrated development targets in-depth integration and

coordinated advancement between education and the economy and society, driving education to open up to society and industries (Zhi, 2023). To address various “fragmentation” challenges in educational practice, the education system must break institutional boundaries via governance instruments and create institutional space for collaborative governance supported by external mechanisms (Liu, 2024).

As a higher tier of China’s modern vocational education system, undergraduate vocational education centers on cultivating high-level technical and skilled talents, combining the characteristics of higher education with vocational and technical education. Collaborative development has become an evident trend for undergraduate vocational education. “Collaborative development of vocational education means that vocational education development increasingly relies on joint collaboration among multiple social departments and industries” (Ma, 2023).

Collaborative governance theory provides a core analytical tool for school-enterprise cooperation in undergraduate vocational education: school-enterprise cooperation in undergraduate vocational education is not a simple cooperative activity, but a governance process involving multiple stakeholders including governments, vocational institutions, enterprises and industry associations, which relies on collaborative governance to realize factor integration, mechanism improvement and efficiency enhancement. Specifically, collaborative governance of school-enterprise cooperation in undergraduate vocational education refers to a governance process with governments, vocational universities, enterprises and industry associations as key stakeholders, taking cultivating high-level technical and skilled talents and serving high-quality industrial development as shared core objectives. Through institutionalized consultation, resource sharing, shared rights and obligations and win-win benefits, all parties conduct in-depth collaboration in specialty construction, curriculum development, talent cultivation, technological research and standard formulation, so as to realize deep coordination among multiple stakeholders and efficient integration of resources.

Practical Breakthroughs in Collaborative Governance of Characteristic Industrial Colleges at Shenzhen Polytechnic University

Characteristic industrial colleges serve as key platforms for undergraduate vocational institutions to deepen industry-education integration and support joint school-enterprise education. Co-established by vocational universities, leading industrial enterprises and industry associations, they rely on regional pillar, emerging and future industries to realize precise alignment between specialty chains and industrial chains. Defined by distinct industrial characteristics, in-depth school-enterprise integration, diversified governance structures and targeted talent cultivation objectives, they constitute a vital organizational form of school-enterprise cooperation in undergraduate vocational education. From a methodological perspective, the collaborative governance features of undergraduate vocational education resonate uniquely with the multi-stakeholder governance philosophy of stakeholder theory, a resonance rooted in the high-level governance demands of undergraduate vocational education (Qiu & Jia, 2025).

As China’s first undergraduate vocational university upgraded from a national high-level vocational college, Shenzhen Polytechnic University has co-founded 18 characteristic industrial colleges with leading enterprises including Huawei, BYD and UBTECH centering on Shenzhen’s “20+8” industrial clusters. It innovates the collaborative talent cultivation model of “Nine Joint Initiatives” and conducts collaborative governance practices covering objectives, stakeholders and mechanisms, forming the “Shenzhen Experience” for characteristic industrial college construction and offering valuable references for school-enterprise cooperation in

undergraduate vocational education.

Goal Coordination: Aligning Shared Goals and Building Consensus

Objective collaboration serves as the logical starting point of collaborative governance. Centering on the core objective of “supporting Shenzhen’s industrial development and cultivating high-level technical and skilled talents”, Shenzhen Polytechnic University integrates differentiated objectives of governments, universities, enterprises and industry associations to build an goal coordination framework for characteristic industrial colleges and reach consensus on cooperation values.

(1) Establishing shared core objectives. The core shared objective is defined as “cultivating high-level technical and skilled talents matching the demands of Shenzhen’s ‘20+8’ industrial clusters and boosting the development of new quality productive forces”. It clarifies the public service objectives of governments, talent cultivation objectives of universities, talent reserve and technological innovation objectives of enterprises, and standard-setting objectives of industry associations, enabling concerted efforts toward aligned multi-stakeholder targets. Sub-objectives are specified to guide the whole cooperation process. Shenzhen Polytechnic University and cooperative enterprises jointly formulate targeted talent cultivation objectives, taking objective achievement as the core benchmark for resource input, incentive evaluation and cooperation assessment. For instance, the BYD Applied Technology College targets the development of the new energy vehicle industry; the Huawei ICT College aims to cultivate high-level technical and skilled talents in the ICT sector to support the development of Huawei’s industrial chain; the UBTECH Embodied Intelligence Industrial College commits to nurturing talents for embodied intelligence and humanoid robot industries and building a benchmark industrial college nationwide.

(2) Forming a long-term symbiotic cooperation consensus. The co-construction of characteristic industrial colleges between Shenzhen Polytechnic University and leading enterprises such as Huawei and BYD is based on a long-term development philosophy to realize in-depth integration and co-creation. Cooperation evolves from ad-hoc project collaboration to strategic partnership, with 3-5 year long-term cooperation frameworks signed to consolidate the foundation of school-enterprise collaborative governance. A cross-cycle regular talent cultivation feedback mechanism is established to form a closed loop covering talent training, enterprise employment, teaching optimization and quality improvement, creating a virtuous cycle of “cultivation–employment–optimization–re-cultivation”.

Stakeholder Coordination: Clarifying Roles and Responsibilities

Breaking the traditional school-dominated unilateral governance model, characteristic industrial colleges establish a four-dimensional collaborative governance framework of “government guidance, university leadership, enterprise co-governance and industry support”, clarifying the rights and obligations of each stakeholder to achieve joint collaborative governance.

(1) Government guidance. The Shenzhen Municipal Government issued policies to promote high-quality vocational education, increased fiscal investment, and rolled out supporting measures including tax incentives, land matching and financial support for Shenzhen Polytechnic University’s characteristic industrial colleges. It took the lead in establishing Municipal-level Industry-Education Consortium (MIEC) and Industry-specific Industry-Education Integration Community (IEIC) to coordinate regional educational and industrial resources, build school-enterprise communication platforms, and provide policy guarantees and resource support for industrial college construction.

(2) University leadership. As the principal institutional actor and coordinator in collaborative governance,

Shenzhen Polytechnic University establishes a modern governance structure for industrial colleges. A specialized school-enterprise cooperation management department is set up to coordinate the construction of all characteristic industrial colleges and serve as a communication bridge between schools and enterprises. The governance model of “Dean Responsibility System under the Leadership of the Industrial College Council” is adopted, with councils composed of university administrators, enterprise executives and industrial experts to realize joint decision-making by multiple stakeholders over specialty construction, curriculum development, teaching organization and student management. A dual-dean system is implemented, with deans jointly appointed by universities and enterprises to participate directly in day-to-day college management.

(3) Enterprise co-governance. Enterprises act as the core driving force of collaborative governance in characteristic industrial colleges. Their dual-subject status in talent cultivation, practical teaching and technological innovation is affirmed, granting enterprises full rights to participate in talent cultivation scheme formulation, specialty construction, curriculum development, teaching implementation and assessment evaluation. Leading enterprises including Huawei, BYD and UBTECH engage deeply in the operation of characteristic industrial colleges, investing equipment, technological projects, engineering faculty and production scenarios, and participating in the entire teaching process to form genuine talent cultivation communities.

(4) Industry support. Industry associations function as standard hubs in the operation of characteristic industrial colleges. They participate extensively in constructing an integrated system of “specialty teaching standards—post competency standards—vocational certification standards”, promoting full alignment between educational standards, industrial standards and vocational qualification standards in industrial college operation. Cooperating with industry associations such as Shenzhen Automotive Electronics Industry Association, New Energy Vehicle Industry Association and Artificial Intelligence Industry Association, they formulate industrial talent standards, release talent demand reports, conduct industrial certification and quality evaluation, deliver precise guidance for school-enterprise cooperation, carry out quality assessment of characteristic industrial colleges, and advance standardized, high-quality talent cultivation.

Mechanism Coordination: The “Nine Joint Initiatives” and Full-Process Collaborative Governance

Shenzhen Polytechnic University has developed the school-enterprise collaborative talent cultivation mechanism of “Nine Joint Initiatives”, namely jointly carrying out Party building and ideological and political education, jointly developing specialties and curriculum standards, jointly building high-level teaching teams, jointly tackling key technologies and processes, jointly formulating industrial standards, jointly developing vocational qualification certificates, jointly conducting innovation and entrepreneurship education, jointly implementing modern apprenticeship training, and jointly launching international cooperative school-running programs. Covering the whole chain of high-skilled talent cultivation, this mechanism establishes a systematic and regular collaborative governance system, completing the transformation of school-enterprise cooperation from isolated bilateral projects to systematic collaborative governance.

Guided by the “Nine Joint Initiatives” mechanism, the characteristic industrial colleges of Shenzhen Polytechnic University promote in-depth integration of education chains, talent chains, industrial chains and innovation chains, optimize the allocation of five core resource areas including faculty, practical training facilities, technology and standards, institutions and culture, and realize deep synergy between educational and industrial resources.

First, synergy of faculty resources. Faculty resources flow in both directions between the university and

enterprises within characteristic industrial colleges. Senior engineers from Huawei, BYD, UBTECH and other enterprises are hired as industrial mentors, while full-time faculty participate in on-site practice at leading enterprises to build high-level dual-qualified teaching teams. A two-way temporary assignment and joint employment system for enterprise engineers and university teachers is established, with quantifiable requirements for teachers' enterprise practice hours and engineers' teaching hours. Characteristic industrial colleges integrate the functions of faculty development centers and enterprise practice bases to enable regular improvement of teachers' practical competencies.

Second, synergy of practical training resources. Practical training facilities are co-constructed and shared by industrial colleges. Enterprises open production equipment to universities, while universities make research instruments accessible to enterprises, ensuring synchronous upgrading of teaching, research and production equipment. Integrated training bases combining “campus factories” and “factory campuses” are developed, creating intelligent training platforms where production scenarios double as teaching scenarios, aligning students' learning environments with enterprise production environments.

Third, synergy of technology and standard resources. A closed-loop system of “teaching–industry–innovation” is formed within industrial colleges. Cutting-edge industrial technologies, technical processes and standards of enterprises are fully integrated into curriculum content, and research achievements are connected with enterprise demands to jointly build a development chain of “technological research projects—project-based courses—achievement transformation”.

Fourth, synergy of institutional resources. Institutional documents including *Measures for the Construction and Administration of Industrial Colleges* and *Performance Assessment Measures for School-Enterprise Cooperation* are issued to standardize the operation of characteristic industrial colleges. Standardized school-enterprise cooperation agreements clearly define key clauses covering rights and obligations, resource investment, project benefits, achievement transformation, intellectual property rights and risk allocation, with annual evaluation and dynamic revision to maintain institutional adaptability.

Fifth, synergy of cultural resources. Cultural education platforms are built in characteristic industrial colleges, incorporating the spirit of labor, model workers and craftsmanship as well as unique corporate cultures of leading enterprises including Huawei, BYD and DJI. Humanistic courses focusing on vocational literacy are developed; students regularly conduct immersive research tours at enterprise R&D centers and production lines. Skill competitions, innovation salons and craftsman sharing seminars are co-hosted, helping bring industrial culture into the campus environment and achieving deep integration between industrial and campus culture.

References

- Chen, Z. M. (2022). *The art of public governance: Research in public administration*. China Social Sciences Press.
- Huang, Y. (2019). *Integration of industry and education: Research and practice*. Beijing Institute of Technology Press.
- Li, N. (2021). The “circle structure” of vocational education cooperation system in the Guangdong-Hong Kong-Macao Greater Bay Area and its governance. *Higher Education Exploration*, (6), 74-85.
- Lin, X. P., Cheng, J. J., & Xu, S. J. (2024). Demands, conflicts and collaborative governance of stakeholders in the digital transformation of vocational education. *Vocational and Technical Education*, (22), 45-50.
- Liu, H. M. (2024). *Research on paths for high-quality development of education in the new era*. Shenzhen Publishing House.
- Ma, J. F. (2023). *Vocational pedagogy*. East China Normal University Press.
- Qiu, X. J., & Jia, H. J. (2025). Development dilemmas and breakthrough paths of undergraduate vocational education from the stakeholder theory perspective. *Modern Educational Management*, (12), 106-117.
- Zhao, G. Z. (2018). *Research on school-enterprise cooperation in vocational education*. Shantou University Press.

- Zheng, L. Q., & He, Z. (2025). From “collaborative inertia” to collaborative governance: Institutional dilemmas and breakthrough paths of vocational-general education integration. *Vocational and Technical Education*, (24), 15-24.
- Zhi, T. J. (2023). *Educator's observation: Chinese-style educational modernization*. East China Normal University Press.
- Vocational Education Law of China. (2022). [Statute]. National People's Congress of China.