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Dilemma Resolution and Path Optimization of "Four-Chain Integration" Talent Cultivation for Logistics Engineering Technology Specialty Groups in Vocational Undergraduate Education from the Perspective of Cross-Domain Collaboration

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Abstract: As an important component of China's modern vocational education system, vocational undergraduate education undertakes the strategic mission of cultivating high-level technical and skilled talents. Driven by the in-depth transformation of the industrial chain and the accelerated penetration of the digital economy, logistics engineering technology specialty groups are faced with the deep-seated contradiction of structural mismatch between the supply side of talent cultivation and the demand side of the industry. Based on the theoretical perspective of cross-domain collaboration, this paper systematically explains the internal logic and operation mechanism of the "four-chain integration" of education chain, talent chain, industrial chain and innovation chain, deeply analyzes the practical dilemmas such as inter-chain fracture, collaborative failure, absence of standards and ecological closure faced by the current "four-chain integration" talent cultivation of logistics engineering technology specialty groups in vocational undergraduate education, and then proposes systematic path optimization schemes from the dimensions of constructing cross-domain collaborative governance mechanism, reconstructing curriculum system, building industry-education integration platforms, promoting the leap of faculty competence and innovating evaluation system, so as to provide theoretical support and practical reference for the high-quality development of logistics engineering technology specialty groups in vocational undergraduate education.

1. Introduction

With the accelerated restructuring of the global industrial chain and the transformation and upgrading of China's manufacturing industry towards high-end, intelligent and green development, the logistics industry is undergoing a profound transformation from a traditional labor-intensive industry to a technology-intensive and knowledge-intensive one. The emergence of new business forms such as smart logistics, digital supply chain and green logistics has put forward unprecedented high requirements for the knowledge structure, technical ability and innovative literacy of

practitioners in the logistics field. As a bridge connecting secondary vocational education, junior college vocational education and general undergraduate education, vocational undergraduate education is positioned to cultivate high-level technical and skilled talents with both solid theoretical foundation and exquisite practical ability, which is highly consistent with the urgent demand of the logistics industry for compound and innovative talents [1].

The logistics engineering technology specialty group covers multiple professional directions such as logistics engineering, supply chain management, intelligent logistics technology and cold chain logistics, and the quality of its talent cultivation is directly related to the technological progress and efficiency improvement of the logistics industry. However, in practice, the talent cultivation of logistics engineering technology specialty groups in vocational undergraduate education still faces many deep-seated contradictions: the connection between the education chain and the industrial chain is not close enough, and there is a deviation between talent cultivation specifications and post competence requirements; there is a lack of effective docking mechanism between the supply structure of the talent chain and the dynamic changes of industrial talent demand; the achievement transformation of the innovation chain has not been fully integrated into the whole process of talent cultivation; the synergistic effect among the four chains has not been effectively released. The root of these problems lies in that the traditional talent cultivation mode is constrained by single subject logic and closed school-running thinking, and lacks systematic design of cross-domain collaboration.

Cross-domain collaboration theory emphasizes the interactive coupling and resource sharing among different subjects, fields and levels, which provides a new analytical framework for breaking the structural obstacles in the "four-chain integration". Introducing the concept of cross-domain collaboration into the talent cultivation system of logistics engineering technology specialty groups in vocational undergraduate education helps to break the barriers among the education chain, talent chain, industrial chain and innovation chain, and build a new open, dynamic and collaborative talent cultivation ecosystem. Based on this research purpose, this paper systematically diagnoses the dilemmas of "four-chain integration" talent cultivation and explores the path optimization scheme from the perspective of cross-domain collaboration.

2. Theoretical Connotation and Logical Framework of "Four-Chain Integration"

2.1 Concept Definition and Functional Orientation of the "Four Chains"

The education chain refers to the complete education operation chain from the setting of talent cultivation objectives, the construction of curriculum system, the implementation of teaching process to the feedback of quality evaluation, and its core function is knowledge transmission and ability shaping. In the logistics engineering technology specialty group of vocational undergraduate education, the education chain bears the basic function of systematically imparting logistics engineering theories, technical methods and practical skills to students, and is the fundamental support for talent cultivation.

The talent chain refers to the complete chain from the definition of talent specifications, the cultivation of ability and quality, the career development channel to the realization of talent value, and its core function is to realize the effective supply and rational allocation of human resources. The talent chain of logistics engineering technology specialty groups in vocational undergraduate education needs to accurately meet the demand of the logistics industry for high-level technical and skilled talents, so as to ensure that graduates have post competence and career development potential.

The industrial chain refers to the complete value creation chain from raw material supply, manufacturing, circulation and distribution to terminal consumption. In the logistics field, it is

specifically manifested as the organic connection of links such as warehousing, transportation, distribution, information processing and supply chain management. The industrial chain is the source of demand for the education chain and the talent chain, and its technological change and structural upgrading directly determine the direction and focus of talent cultivation.

The innovation chain refers to the complete innovation process chain from basic research, applied research, technology development to industrialized application of achievements, and its core function is to promote technological progress and industrial upgrading. In the field of logistics engineering technology, the innovation chain covers multiple levels such as intelligent algorithm research and development, logistics equipment innovation and supply chain model innovation, which is the power source to improve the level and quality of talent cultivation.

2.2 Internal Logic of "Four-Chain Integration"

"Four-chain integration" is not a simple superposition or linear connection of the four chains, but emphasizes the deep coupling, dynamic interaction and co-evolution among the four chains. The education chain provides a cultivation carrier for the talent chain, the talent chain provides human support for the industrial chain, the industrial chain provides application scenarios for the innovation chain, and the innovation chain in turn provides content updating and technical empowerment for the education chain. The four chains form an organic whole with closed-loop feedback and spiral rise.

In the context of logistics engineering technology specialty groups in vocational undergraduate education, the specific manifestations of "four-chain integration" are as follows: the curriculum content and teaching methods of the education chain should keep up with the technological change trend of the industrial chain, and timely transform the latest achievements of the innovation chain into teaching resources; the cultivation specifications of the talent chain should accurately match the post competence requirements of the industrial chain, and at the same time reserve technical talents with R&D potential for the innovation chain; the real projects and technical problems of the industrial chain should become teaching materials and practice platforms of the education chain; the R&D process of the innovation chain should become an important carrier for the cultivation of innovation ability in the talent chain.

2.3 Theoretical Support of Cross-Domain Collaboration

Cross-domain collaboration theory originates from the cross-integration of system theory, synergetics and inter-organizational relationship theory, and its core essence is that different fields, subjects and levels can achieve the synergistic effect that the overall efficiency is greater than the sum of parts through information sharing, resource complementarity, goal alignment and mechanism coupling [2]. Applying cross-domain collaboration theory to "four-chain integration" talent cultivation means breaking through the organizational boundaries and institutional barriers between schools and enterprises, education and industry, teaching and R&D in the traditional education system, and building a collaborative education system with the participation of multiple subjects, in-depth integration of various resources and seamless connection of multiple links.

The specific manifestations of cross-domain collaboration in "four-chain integration" include: cross-organizational collaboration (collaborative participation of multiple subjects such as schools, enterprises, scientific research institutes and industry associations), cross-domain collaboration (cross-integration of logistics technology with information technology, management science, engineering technology and other multidisciplinary fields), cross-regional collaboration (resource sharing and complementary advantages among colleges and universities in different regions, and

between colleges and industries in different regions), and cross-level collaboration (through connection between different education levels such as secondary vocational education, higher vocational college education, vocational undergraduate education and general undergraduate education).

3. Practical Dilemmas of "Four-Chain Integration" Talent Cultivation for Logistics Engineering Technology Specialty Groups in Vocational Undergraduate Education

3.1 Inter-chain Fracture: Supply-Demand Mismatch Between Education Chain and Industrial Chain

At present, there is an obvious structural fracture in the connection between the education chain and the industrial chain of logistics engineering technology specialty groups in vocational undergraduate education. The curriculum system is often set up following subject logic rather than industrial logic, and the update speed of textbook content lags far behind the technological iteration rhythm of the logistics industry. Taking intelligent logistics technology as an example, cutting-edge technologies such as digital twins, blockchain traceability and unmanned delivery have been widely used in the industry, but the courses of most vocational undergraduate colleges still stay at the basic level such as traditional warehousing management and transportation scheduling, resulting in a long post adaptation period for students after graduation.

The disconnection between practical teaching links and real industrial scenarios is also prominent. Some colleges have outdated training equipment, and the simulation scenarios are quite different from the real logistics operation environment, so it is difficult for students to obtain immersive industrial experience. School-enterprise cooperation mostly stays at the shallow level of visit internship and post internship, lacking in-depth project cooperation and joint technical research, and the education chain has not been truly embedded in the value creation process of the industrial chain.

3.2 Collaborative Failure: Imperfect Cooperation Mechanism among Multiple Subjects

"Four-chain integration" requires schools, enterprises, governments, industry associations, scientific research institutes and other multiple subjects to form a synergistic force, but in reality, the cooperation among various subjects often faces problems such as insufficient motivation, unsmooth mechanism and uneven benefit distribution. The enthusiasm of enterprises to participate in vocational education is restricted by short-term cost-benefit considerations, and their willingness to deeply participate in talent cultivation is not strong; schools are often in a passive position in cooperation with enterprises, and it is difficult to obtain core technologies and real project resources; the government’s policy guidance and resource allocation functions in industry-education integration have not been fully exerted; the bridging role of industry associations in standard formulation and quality certification needs to be strengthened.

The lack of cross-domain collaborative governance mechanism makes the cooperation among various subjects present fragmented and short-term characteristics, lacking long-term stable institutional arrangements and benefit-sharing mechanisms. Some school-enterprise cooperation projects are interrupted due to personnel changes, policy adjustments or market changes, making it difficult to form a sustained synergistic effect.

3.3 Absence of Standards: Insufficient Docking Between Talent Cultivation Specifications and Industrial Competence Standards

The talent cultivation standard system of logistics engineering technology specialty groups in vocational undergraduate education is still imperfect, which is highlighted as follows: the connection between professional teaching standards and vocational skill level standards is not close enough, and the integration mechanism of academic certificates and vocational skill level certificates has not been fully established [3]; the formulation of talent cultivation specifications lacks in-depth participation from the industrial side, and the description of competence indicators is too general to accurately guide curriculum development and teaching implementation; the talent cultivation standards vary greatly among different colleges, lacking unified bottom-line requirements and space for characteristic development.

Under the framework of "four-chain integration", the standards of the talent chain should simultaneously respond to the post competence requirements of the industrial chain, the technical R&D requirements of the innovation chain and the academic standard specifications of the education chain. However, the standard docking among the three is still in the exploratory stage, lacking mature reference systems and implementation paths.

3.4 Ecological Closure: Unsmooth Channel for the Transformation of Innovation Chain Achievements to Education Chain

There is an obvious lag in the transformation of innovative achievements in the field of logistics engineering technology to the vocational undergraduate education chain. Most of the logistics technology R&D achievements of universities and scientific research institutes are presented in the form of papers, patents, etc., lacking secondary development and transformation mechanisms for teaching applications. Internal logistics technology innovations of enterprises (such as intelligent sorting system optimization algorithms and supply chain risk early warning models) are difficult to be directly transformed into teaching resources due to trade secrets.

The problem of information asymmetry between the innovation chain and the education chain is prominent. Teachers have limited ability to perceive the frontier technological trends of the industry, and the update of teaching content mainly relies on indirect channels such as textbook reprints and academic conferences, lacking a real-time docking mechanism with the frontier of industrial innovation. This ecologically closed state makes it difficult for talent cultivation to reflect the technological frontier and innovation leadership that vocational undergraduate education should have.

3.5 Competence Gap: Faculty Team Difficult to Support the Teaching Requirements of "Four-Chain Integration"

"Four-chain integration" puts forward compound competence requirements for the faculty team: teachers should not only have solid academic theoretical foundation, but also have rich industrial practical experience; they should not only be able to carry out applied technology research and development, but also be able to transform technical achievements into teaching content. However, the current faculty team of logistics engineering technology specialty groups in vocational undergraduate education generally has a single growth path of "from school to school", lacking enterprise work experience and industrial technology accumulation, and is difficult to be competent for teaching tasks under the background of cross-domain collaboration.

The identification standard of "double-qualified" teachers focuses more on certificates and professional titles, and the assessment of actual industrial technical ability and project experience is

not sufficient. The teacher enterprise practice system is not implemented in place, and the enterprise practice of some teachers is formalistic, failing to truly go deep into the industrial front line to participate in technology research and development and project management.

4. Path Optimization of "Four-Chain Integration" Talent Cultivation from the Perspective of Cross-Domain Collaboration

4.1 Constructing Cross-Domain Collaborative Governance Mechanism to Consolidate the Institutional Foundation of "Four-Chain Integration"

Establishing a multi-party collaborative governance structure led by the government, with schools as the main body, enterprise participation, industry guidance and social support is the institutional premise for promoting "four-chain integration" talent cultivation. Specifically, relying on regional logistics industry development alliances or industry-education integration communities, a regular cross-domain collaborative governance platform can be built to clarify the rights and responsibilities boundaries and benefit distribution mechanism of each participating subject.

In the design of governance mechanism, attention should be paid to the following dimensions: establish a demand-oriented dynamic professional adjustment mechanism, regularly carry out logistics industry talent demand research and post competence analysis, and adjust professional directions and cultivation scales accordingly; establish a resource sharing and benefit compensation mechanism, and motivate enterprises to deeply participate in talent cultivation through policy tools such as tax incentives, financial subsidies and project funding; establish a quality sharing and achievement sharing mechanism, and clarify the handling rules for key issues such as intellectual property ownership and achievement transformation income distribution in school-enterprise cooperation; establish an information exchange and feedback improvement mechanism, and use digital platforms to realize the real-time circulation of industrial demand information, talent cultivation data and employment quality feedback.

4.2 Reconstructing Modular Curriculum System to Realize the Deep Embedding of Education Chain and Industrial Chain

The reform of curriculum system is the core link of "four-chain integration" talent cultivation. It is necessary to break the traditional subject-based curriculum organization mode and build a modular curriculum system oriented by industrial competence requirements and carried by project tasks.

In terms of curriculum structure, a four-tier structure of "basic competence module + professional technology module + innovative practice module + cross-domain expansion module" can be set up. The basic competence module covers general basic courses such as mathematics, physics and information technology, laying a foundation for students' sustainable development; the professional technology module sets up course groups around the core technical fields of logistics engineering (such as intelligent warehousing technology, transportation optimization technology, supply chain digital technology, etc.) to ensure that students master solid professional core competence; the innovative practice module takes real industrial projects and technical research topics as carriers to cultivate students' engineering practice ability and innovative thinking; the cross-domain expansion module introduces knowledge content of adjacent disciplines such as information technology, management science and engineering technology to broaden students' knowledge vision and cross-border integration ability.

In terms of curriculum content update mechanism, an agile update mechanism of "industrial technology dynamic tracking - teaching content rapid response" should be established. Through the

establishment of technical information sharing channels with logistics technology enterprises, new technologies, new processes and new standards in the industry should be integrated into the curriculum content in a timely manner. Flexible content carriers such as "loose-leaf textbooks" and "digital resource packages" can be explored to shorten the cycle of curriculum content update.

In terms of teaching methods, teaching method reforms such as project-based teaching, case teaching, situational teaching and flipped classroom should be vigorously promoted, and real operation cases, technical problems and innovation projects of logistics enterprises should be introduced into the classroom, so that students can realize knowledge construction and ability improvement in the process of solving real problems [4].

4.3 Building Industry-Education Integration Practice Platforms to Promote Accurate Docking Between Talent Chain and Industrial Chain

High-quality practice platforms are the key link connecting the talent chain and the industrial chain. Logistics engineering technology specialty groups in vocational undergraduate education should build a four-level progressive practice platform system of "on-campus training bases - school-enterprise co-built laboratories - enterprise real project workshops - industrial technology innovation centers".

On-campus training bases should be built in line with the mainstream technical equipment and operation processes of the logistics industry, and introduce advanced facilities such as intelligent warehousing systems, automatic sorting equipment and logistics simulation software to provide students with training conditions close to the real industrial environment. School-enterprise co-built laboratories should focus on the frontier directions of logistics engineering technology (such as digital twin logistics systems, green supply chain optimization, logistics big data analysis, etc.). Schools provide venues and basic equipment, while enterprises provide technical resources and real data, and both parties jointly carry out teaching and technical research and development.

Enterprise real project workshops are an important carrier of "four-chain integration". By introducing actual business projects of enterprises (such as the warehousing layout optimization project of an e-commerce enterprise, the supply chain resilience improvement project of a manufacturing enterprise, etc.) into the teaching process, students can complete project tasks under the joint guidance of teachers and enterprise mentors, realizing "learning by doing, doing by learning". Industrial technology innovation centers are oriented to higher-level technical R&D needs, with schools and enterprises jointly applying for scientific research projects, and teachers and students jointly participating in technical research. The achievements of the innovation chain directly feed back the education chain and the talent chain.

In the process of platform construction, attention should be paid to digital empowerment. Virtual simulation technology is used to build a digital twin system of logistics operation scenarios, so that students can carry out scheme design and simulation verification in a virtual environment; cloud platforms are used to realize remote collaboration and resource sharing between schools and enterprises; big data analysis technology is used to accurately portray students' learning behaviors and ability development, providing data support for personalized cultivation [5].

4.4 Promoting the Leap of Faculty Competence and Building Cross-Domain Collaborative Teaching Teams

The faculty team is the key executive force of "four-chain integration" talent cultivation. A four-dimensional integrated teacher competence development framework of "academic competence +

industrial competence + innovation competence + teaching competence" should be constructed to promote the comprehensive leap of teachers' competence through various ways.

In terms of industrial competence improvement, a long-term mechanism for teachers' enterprise practice should be established, requiring professional teachers to have no less than six months of enterprise practice experience accumulated every five years, and the practice content should be closely related to teachers' professional directions, and participate in actual technical research and development or management optimization projects of enterprises [6]. The "visiting engineer" system can be explored, and key teachers can be selected to serve as technical consultants or project participants in logistics technology enterprises to deeply integrate into the industrial innovation process.

In terms of innovation ability cultivation, teachers should be encouraged to carry out scientific research activities around applied problems in the field of logistics engineering technology, and transform scientific research achievements into teaching cases and experimental projects. The school supports teachers and enterprise technical personnel in jointly applying for scientific research projects, publishing academic papers, and applying for technical patents, so as to improve teachers' technological innovation capabilities and industrial insight through scientific research cooperation.

In terms of teaching team construction, the pattern of single source of on-campus teachers should be broken, and a diversified teaching team composed of full-time on-campus teachers, part-time enterprise teachers, industry experts and researchers from scientific research institutes should be built. Through organizational forms such as "double tutor system", "project-based teaching team" and "interdisciplinary teaching community", knowledge complementarity and ability synergy among teachers with different backgrounds can be realized.

4.5 Innovating Evaluation System and Establishing Quality Assurance Mechanism Oriented by "Four-Chain Integration"

The reform of the evaluation system is an important lever to guide the direction of "four-chain integration" talent cultivation. A multi-dimensional evaluation system covering process evaluation and result evaluation, internal evaluation and external evaluation, competence evaluation and literacy evaluation should be constructed.

In terms of student evaluation, the traditional examination mode should be broken through, and multiple evaluation methods such as project achievement evaluation, practical ability assessment, innovative work display and enterprise mentor evaluation should be introduced. Special attention should be paid to the investigation of students' ability to solve complex engineering problems, cross-domain collaboration ability and continuous learning ability, which are the core objectives of "four-chain integration" talent cultivation.

In terms of professional evaluation, a professional quality evaluation standard with industrial contribution and talent adaptation as core indicators should be established. Specific indicators can include: employment matching rate and starting salary level of graduates, employer satisfaction, career development tracking data of graduates, quantity and quality of school-enterprise cooperation projects, technical service and achievement transformation results, etc. The objectivity and credibility of evaluation should be enhanced by introducing third-party evaluation institutions.

In terms of teacher evaluation, the evaluation orientation of only papers and only topics should be reformed, and teachers' contributions to participating in industry-education integration projects, the effectiveness of guiding students' practical innovation, and the performance of technical services and achievement transformation should be included in the professional title evaluation and performance

appraisal system, so as to motivate teachers to actively devote themselves to the practice of "four-chain integration" talent cultivation [7].

4.6 Promoting Digital Empowerment and Building Intelligent Talent Cultivation Support System

Digital transformation provides new technical means and implementation paths for "four-chain integration" talent cultivation. New generation information technologies such as big data, artificial intelligence, cloud computing and blockchain should be fully utilized to build an intelligent talent cultivation support system.

In terms of teaching resource construction, a digital teaching resource database in the field of logistics engineering technology can be developed, including virtual simulation experiments, online courses, case databases, project databases, etc., to realize cross-school sharing and open access of high-quality teaching resources. Artificial intelligence technology is used to develop an intelligent guidance system, which provides personalized learning path recommendations and real-time feedback according to students' learning progress and ability level.

In terms of informatization of industry-education integration, a school-enterprise collaborative education information platform can be built to realize the whole-process digital management of enterprise demand release, project docking, process management and achievement display. Blockchain technology is used to establish a credible deposit system for students' competence certificates and credit mutual recognition, providing technical guarantee for credit conversion and achievement mutual recognition in "four-chain integration".

In terms of quality monitoring, big data analysis technology can be used to collect and analyze the whole process of talent cultivation, establish a real-time monitoring and early warning mechanism for talent cultivation quality, and provide data support for teaching improvement and decision optimization.

5. Practical Exploration and Guarantee Mechanism

5.1 Promoting the Systematic Design of "Four-Chain Integration" with Specialty Groups as Units

The logistics engineering technology specialty group includes multiple related professional directions. To promote "four-chain integration", systematic design should be carried out with the specialty group as the basic unit, so as to avoid separate governance and repeated construction of each specialty. At the specialty group level, the positioning, division of labor and collaborative relationship of each specialty in the group should be clarified, and shared curriculum platforms and practice bases should be built to realize the intensive utilization and complementary advantages of resources within the group.

Taking Chongqing Vocational University of Electronic Science and Technology as an example, the logistics engineering technology specialty group can focus on the core theme of "smart logistics", organically integrate professional directions such as logistics engineering technology, supply chain management and intelligent logistics technology, and form a curriculum structure of "bottom sharing, middle separation, top mutual selection". The bottom shared courses include Introduction to Logistics, Fundamentals of Operations Research, Fundamentals of Information Technology, etc.; the middle separate courses reflect the characteristic directions of each specialty; the top mutual selection courses allow students to take elective courses across specialties to cultivate compound competence.

5.2 Establishing a Long-Term Guarantee Mechanism for "Four-Chain Integration" Talent Cultivation

The sustained advancement of "four-chain integration" talent cultivation requires the support of a sound guarantee mechanism. In terms of organizational guarantee, a leading group for "four-chain integration" talent cultivation led by school leaders and coordinated by multiple departments should be established to coordinate all work such as professional construction, school-enterprise cooperation, scientific research transformation and quality monitoring [8]. In terms of fund guarantee, special funds for "four-chain integration" talent cultivation should be set up for investment in curriculum development, platform construction, teacher training, project cooperation and other aspects. In terms of institutional guarantee, supporting institutional documents such as administrative measures for school-enterprise cooperation, teacher enterprise practice system, credit mutual recognition and conversion rules, and intellectual property management measures should be formulated and improved to provide institutional norms for "four-chain integration".

5.3 Focusing on Regional Characteristics and Differentiated Development

There are differences in the development level, industrial structure and talent demand of the logistics industry in different regions. The "four-chain integration" talent cultivation of logistics engineering technology specialty groups in vocational undergraduate education should be designed differently in close combination with regional industrial characteristics. Taking the Chengdu-Chongqing region as an example, the region is accelerating the construction of the New International Land-Sea Trade Corridor in the west and the Chengdu-Chongqing Economic Circle, and there is a strong demand for talents in cross-border logistics, multimodal transport, cold chain logistics and other fields. The talent cultivation of specialty groups should focus on these regional strategic needs to form distinctive talent cultivation directions.

At the same time, attention should be paid to forming a pattern of misplaced development and collaborative complementarity with other colleges and universities in the region to avoid homogeneous competition. Through platforms such as regional logistics vocational education alliances, in-depth cooperation such as mutual course selection, credit mutual recognition, mutual teacher employment and base sharing can be realized, so as to improve the overall efficiency of regional logistics talent cultivation.

5.4 Strengthening International Vision and Standard Docking

Under the background of globalization, the internationalization and standardization trend of the logistics industry is increasingly obvious. The "four-chain integration" talent cultivation of logistics engineering technology specialty groups in vocational undergraduate education should have an international vision. Advanced educational concepts and curriculum standards in the field of international logistics and supply chain management can be introduced, and international vocational education experiences such as the German "dual system" and the Australian TAFE system can be used for reference, and localized transformation can be carried out in combination with China’s national conditions [9].

Actively participate in the docking of international logistics certification systems, encourage students to obtain internationally recognized vocational qualification certificates in logistics and supply chain management, and improve the international competitiveness of graduates. Through projects such as cooperative education, joint training, teacher-student exchanges with foreign universities and logistics enterprises, the international dimension of "four-chain integration" can be

expanded.

6. Conclusion

The "four-chain integration" talent cultivation of logistics engineering technology specialty groups in vocational undergraduate education from the perspective of cross-domain collaboration is a systematic project, involving multiple levels such as the renewal of educational concepts, institutional mechanism innovation, curriculum system reconstruction, platform carrier construction, faculty ability improvement and evaluation system innovation. Facing the current practical dilemmas such as inter-chain fracture, collaborative failure, absence of standards, ecological closure and competence gap, it is necessary to take cross-domain collaboration as the methodological guidance, take "four-chain integration" as the value orientation, take institutional innovation as the breakthrough point, and take digital empowerment as the technical support to systematically promote the in-depth reform of the talent cultivation mode.

Vocational undergraduate education is in a critical period of connotative development. As an important talent cultivation position serving the high-quality development of the modern logistics industry, logistics engineering technology specialty groups should actively adapt to the trend of industrial transformation, deepen industry-education integration and integration of science and education, and explore a new talent cultivation paradigm with Chinese characteristics and vocational undergraduate characteristics under the framework of "four-chain integration". Only in this way can we truly realize the organic connection and in-depth integration of the education chain, talent chain, industrial chain and innovation chain, and provide solid talent support and intellectual guarantee for the transformation, upgrading and high-quality development of the logistics industry. This exploration is not only of great significance to the development of logistics engineering technology specialty groups themselves, but also provides a referable theoretical framework and practical experience for the "four-chain integration" talent cultivation of other vocational undergraduate specialty groups.

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References

[1] Nie Jianyu. Research on the Construction of Faculty Team in Private Vocational Undergraduate Colleges: A Case Study of Jiangxi Province [D]. Jiangxi Science & Technology Normal University, 2024.

[2] Wen Lili. Research on the Path of Deepening Industry-Finance Integration Audit to Support the Strategic Transformation of Urban Investment Platforms [J]. Knowledge Economy, 2025, (33): 109-112.

[3] Chen Lu. Research on the Integration of Courses and Certificates of the "1+X" Certificate System in Higher Vocational Education [J]. Modern Communication, 2021, (19): 23-26.

[4] Zhang Zhijun, Luo Yong, Si Xuefeng, et al. Research and Practice of Talent Cultivation Mode for New Engineering Majors Oriented to Engineering Education Professional Accreditation [J]. Journal of Higher Education, 2025, 11(35): 71-74+79.

[5] Chen Sha, Tang Chaonan. Innovation of Student Management and Cultivation Mode under the Vocational Education System [J]. The Guide of Science & Education, 2024, (26): 145-147.

[6] Huang Tao, Wang Peng, Su Keqiang. Research on the Innovation Path of Vocational Ability Cultivation for Sports Majors from the Perspective of Industry-Education Integration [J]. Silk Road Vision, 2025, (4): 178-180.

[7] Dong Chuanmin, Sun Qingrong. Research on Policies Supporting Teachers' Technical Services and Social Services

in Vocational Colleges [J]. Chinese Scientific and Technical Journal Database (Abstract Edition) Education, 2022(9): 3.
[8] Xue Min, Yu Zuguo, Zhang Pu, et al. A Preliminary Study on the Integration of Curriculum Ideology and Politics into Innovation and Entrepreneurship Education in Local Universities: Taking Xiangtan University as an Example [J]. Data of Culture and Education, 2021, (21): 91-93.
[9] Zhao Ying. Classroom Revolution in Higher Vocational Colleges: Reshaping Education Ecology and Leading Future Skill Cultivation [J]. Progress, 2025(12): 249-251.