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Research and Practice on the Digital Talent Training Mode of Logistics Management Major Based on the Integration of Industry and Education in Universities and Enterprises

Fan Jianchang

School of Marketing and Logistics Management, Nanjing University of Finance & Economics, Nanjing, China
fanjianchang@outlook.com

Abstract: *This study takes the national first-class logistics management program at Nanjing University of Finance and Economics as its research object, adopts industry–education integration as its core concept, and conducts collaborative research with JD Logistics. This study focuses on the training of digital talent in the logistics management major, clarifying three key objectives: (1) establishing a scientific education system that integrates industry and education, (2) enhancing graduate competitiveness to support industrial transformation, and (3) developing distinctive program features to provide a replicable model. It also explores specific training pathways and models across five dimensions: formulation of training objectives, optimization of the curriculum system, innovation in teaching methodologies, co-construction of experimental and practical training systems, and refinement of quality assessment mechanisms. The ultimate aim is to cultivate high-quality, application-oriented, and interdisciplinary talent capable of meeting the digital transformation needs of the logistics industry, thereby offering a feasible solution for local universities seeking to enhance digital talent development in logistics management.*

Keywords: *Integration of industry and education; Logistics management; Digital talents*

1. Introduction

With the rapid advancement and widespread adoption of digital technologies, the digital economy—driven by such innovations—has emerged as a pivotal engine of global economic growth. According to the Global Digital Economy White Paper, the combined digital economies of five countries—the United States, China, Germany, Japan, and South Korea—reached USD 31 trillion in 2022, accounting for nearly 60% of their aggregate GDP. The Digital China Development Report (2022) indicates that China's digital economy exceeded RMB 50 trillion in 2022, representing over 40% of national GDP—a doubling since 2017. Deloitte China's Industrial Digital Talent Development Report (2023) highlights that amid nationwide industrial digital transformation, China's current supply of digital talent stands below 10 million, while the demand gap ranges from 25 to 30 million—and continues to widen. Consequently, the insufficient supply and suboptimal quality of digital talent have become critical bottlenecks constraining China's technological innovation, economic restructuring, high-quality development, and the digital upgrading of its industries. As key talent incubators, local universities face an urgent challenge: how to cultivate high-quality digital talent aligned with enterprises' digital transformation needs.

Nanjing University of Finance and Economics' logistics management program—established nearly two decades ago—was designated a National First-Class Undergraduate Program by China's Ministry of Education in 2019. Despite its rich experience and significant achievements in discipline development and talent cultivation, the program faces a critical challenge amid industrial digitalization: a growing misalignment between its graduate competencies and enterprises' demand for digital talent. Compounding this issue, local Chinese universities currently lack practical frameworks for digital talent development—particularly in logistics management—creating substantial barriers to curriculum innovation. Consequently, for institutions like ours, proactively advancing logistics discipline transformation through industry-education integration and cultivating high-quality digital talent capable of meeting industry digitalization needs has become a strategic imperative.

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The industry-education integration talent development model unifies industrial advancement and higher education through deep collaboration, enabling resource sharing and complementary strengths[1,2]. This approach synergistically enhances theoretical instruction and enterprise practice, cultivating high-quality, application-oriented talent with innovative and interdisciplinary capabilities aligned with industry digitalization needs. Amid accelerating industrial digital transformation, enterprises demand professionals who not only demonstrate mastery of domain-specific knowledge but also possess cross-functional digital integration capabilities—applying digital technologies to drive business transformation, generate new value streams, and deliver innovative digital products/services. Consequently, industry-education integration offers local universities a viable framework for developing logistics management programs that systematically cultivate digitally competent talent.

This project will be guided by the educational concept of integrating industry and education, carry out cooperation with JD Logistics, rely on the previous cooperation experience with JD Logistics in the construction of logistics laboratories, integrate JD Logistics' advantages in logistics management methods, logistics human resources, logistics technical equipment, logistics training platforms, as well as its job requirements and ability requirements for digital talents in logistics management, jointly explore and study the digital talent training mode of logistics management under the collaborative education of industry and education integration, and conduct exploratory research from the aspects of talent training objectives, curriculum system, teaching mode, experimental training, and target assessment, so as to cultivate high-quality application-oriented and interdisciplinary digital talents in logistics management that can adapt to industrial digital transformation.

2. Training Objectives of Digital Talents in Logistics Management Major

The reform objectives of this project mainly include the following three aspects:

(1) Through systematic exploration and research into the digital talent development model for the logistics management program at our university, this project aims to establish a coherent, evidence-based training system grounded in industry–education integration, thereby cultivating high-quality digital talent in logistics management.

This project will establish a strategic partnership with JD Logistics, leveraging complementary strengths from both industry and academia to co-develop a digital talent development model for logistics management grounded in the principle of industry–education integration. Specifically, the project will: (1) deploy digital technologies to build an integrated digital teaching and experiential training platform; (2) establish a practice-oriented teaching base co-managed by university and enterprise; (3) embed digital competencies throughout the entire logistics management curriculum; and (4) advance the digital transformation of talent development toward greater systematization, data-driven precision, and pedagogical innovation. The ultimate goal is to institutionalize a sustainable industry–education collaborative ecosystem that cultivates high-caliber digital talent capable of driving enterprise-level digital transformation in the logistics sector.

(2) This initiative aims to cultivate high-caliber digital talent in logistics management through industry–education integration, thereby enhancing the competitiveness and appeal of our logistics management program, supplying industry-ready graduates to national and regional logistics sectors, and actively contributing to the advancement of China’s digital economy strategy and the digital transformation of the logistics industry.

As industries undergo digital transformation and upgrading, the quality of digital talent development directly influences the pace and effectiveness of enterprise-level digital adoption—ultimately shaping regional and national economic outcomes. This project will establish a strategic collaboration with JD Logistics to co-develop an industry–education integrated training model for logistics management. By leveraging JD Logistics’ strengths in digital logistics operations, HR competency frameworks, technical infrastructure, and training platforms, the initiative will systematically enhance students’ practical competencies and digital application skills in real-world logistics contexts. The ultimate goal is to cultivate high-caliber digital talent in logistics management—professionals equipped with strong competitiveness and the agility to drive and adapt to ongoing digital transformation.

(3) Through forward-looking research on digital talent development in logistics management—guided by the principle of industry–education integration—this initiative aims to elevate our logistics management program into a national first-class undergraduate program with distinctive digital

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competencies. The resulting approaches to discipline construction and talent cultivation will serve as a replicable model for digital talent development in logistics and related fields at other universities.

The logistics management program at our university was among the first to be designated a national first-class undergraduate program, reflecting its foundational strength in discipline development. This recognition, however, entails heightened expectations for curriculum innovation and talent cultivation in the context of rapid digital transformation in the logistics sector. Addressing this imperative, the proposed project will systematically explore a digital talent development model through deep collaboration between our program and JD Logistics under the framework of industry–education integration. By embedding digital competencies into core teaching and training processes, the project aims to: (1) enhance the quality of discipline construction and talent development; (2) establish the program as a nationally recognized leader with distinctive digital characteristics; and (3) generate a replicable framework that can inform digital talent initiatives in peer institutions nationwide.

3. Training Paths and Modes of Digital Talents in Logistics Management Major

By strategically leveraging JD Logistics' strengths in digital logistics operations, HR competency systems, technological infrastructure, and experiential training platforms, the initiative will co-develop a digital talent development model for logistics management that aligns with the evolving demands of industrial digital transformation. The research focuses on the following key areas:

(1) Guided by the digital transformation of the logistics industry, this initiative will define competency-based training objectives for digital talent in logistics management through deep industry–education integration.

The positioning of talent training objectives for the logistics management program must adapt to the evolving demands brought about by digital transformation. Our university's digital talent development goals should embody the following key attributes:

First, we should prioritize the cultivation of practical and innovative capabilities. Currently, the talent cultivation of the Logistics Management major in most universities is decoupled from the demands of the logistics industry and enterprises—overemphasizing theoretical knowledge instruction while lacking targeted training of students' practical and innovative capabilities[3]. It is therefore imperative to establish a teaching philosophy centered on capability development as the core cultivation objective, integrate logistics theory with skill training, and cultivate high-end logistics talents who possess a grasp of logistics theoretical analysis, are capable of handling real-world business operations, and can solve practical logistics business problems and make operational decisions.

Second, we should prioritize the cultivation of interdisciplinary knowledge integration competence. Against the backdrop of digital transformation, it is insufficient to cultivate logistics management professionals capable of adapting to such transformation merely by imparting knowledge confined to the single discipline of logistics management. Digital logistics management talents should not only be proficient in logistics business operations, management, and decision-making, but also competent in undertaking tasks including logistics demand forecasting, logistics market development, logistics system optimization, logistics data analysis, and logistics investment management—and this requires mastering knowledge in disciplines such as economics, finance, management, statistics, data science, and computer science[4]. Therefore, the cultivation of digital logistics management talents should prioritize the integration of knowledge across multiple disciplines and foster students' competence in such interdisciplinary integration.

Finally, we should prioritize strengthening digital capabilities. As the logistics industry undergoes digital transformation, various technologies like big data, blockchain, cloud computing, artificial intelligence, and virtual reality are being integrated into every aspect of logistics operations. Enterprises will leverage these digital tools to build intelligent logistics parks, digital warehouses, and advanced logistics information platforms. Consequently, digital talents in logistics management must be adept in applying these technologies practically, enabling them to engage in digital product development, digital operations, and digital marketing.

(2) Guided by the principle of industry–education integration, this initiative will develop a forward-looking curriculum system to cultivate high-caliber digital talent in logistics management.

The traditional curriculum of the logistics management program heavily emphasizes theory over practice, resulting in graduates who often fail to meet the job requirements of the logistics industry and

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enterprises. Particularly in the context of digital transformation within the logistics sector, there is an urgent need for professionals equipped with strong digital skills, interdisciplinary integration abilities, and practical expertise. Based on the educational philosophy of industry–education integration, the development of a qualified digital talent pool in logistics management requires the curriculum system to address several key areas:

First, enterprise participation. Our university's logistics management program will deepen cooperation with JD Logistics, optimizing both the curriculum system and course content according to JD Logistics' needs for digital talent in logistics management. This collaboration aims to ensure that the curriculum structure and content align closely with industry demands for digital talent.

Second, building a multi-disciplinary curriculum cluster. Emphasis should be placed on integrating courses from various disciplines—such as engineering, economics, accounting, computer science, data science, statistics, and business administration—into the logistics management curriculum. This approach ensures interdisciplinary training and cultivates talents with integrated knowledge across multiple fields.

Third, focusing on practical courses. Practical ability is essential for digital talents in logistics management. To enhance this, we will increase the proportion of practical teaching in each specialized course, optimize the curriculum syllabus and content, and use practical teaching to bridge theoretical knowledge with real-world application. Additionally, collaborating with JD Logistics to jointly develop practical teaching content will improve students' practical and application abilities in digital skills. Furthermore, co-developing logistics-specific textbooks and practical training materials with JD Logistics, as well as conducting joint research on teaching reform topics, will further support these efforts.

Fourth, adding digital technology courses. Digital talents in logistics management require comprehensive digital knowledge and skills. When developing courses for digital talent training, it is crucial to integrate new theories and technologies such as big data, the Internet of Things, and artificial intelligence into logistics management courses. This integration provides essential support for cultivating digital skills and application abilities.

Finally, constructing digital curriculum ideological and political elements. Curriculum ideological and political education plays a vital role in nurturing high-quality digital talents in logistics management. By integrating ideological and political elements into the curriculum content and utilizing digital technology to innovate the presentation of these courses, we can enhance the effectiveness of moral education.

(3) This project will innovate teaching approaches by integrating digital technologies within the framework of industry–education integration.

Against the backdrop of digital transformation, it is essential to integrate digital technology throughout the logistics management curriculum to cultivate students' digital awareness and thinking skills, while enhancing their learning initiative and participation through heuristic, inquiry-based, interactive, and personalized teaching methods. The research in this section primarily focuses on the following areas:

First, establish a digital teaching team. The cultivation of digital talent in logistics management requires a teaching team equipped with robust digital competencies. To this end, the Logistics Management Department of our university will leverage JD Logistics’ strengths in digital technology and logistics operations and appoint part-time industry professors, thereby building a high-caliber, multidisciplinary teaching team with strong pedagogical, research, and technical capabilities.

Second, develop a digital teaching information platform. Leveraging JD Logistics’ strengths in digital technology, the university will co-develop an intelligent teaching platform that captures comprehensive data across the entire teaching–learning process. By applying big data analytics, the platform will generate actionable insights into instructional effectiveness and student learning outcomes. These insights will inform the continuous refinement of pedagogical approaches and enable personalized instruction, thereby enhancing the quality of digital talent development in logistics management.

Third, implement blended learning and flipped classroom approaches. By integrating digital technologies into instruction, the project will leverage online platforms such as MOOCs and open-access video courses to redesign course content with cutting-edge logistics technologies and concepts. Smart teaching tools like Rain Classroom will be adopted to support flipped instruction, enhance

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classroom interactivity, and foster students' active learning and critical thinking skills.

Fourth, co-develop online course resources. Guided by the principle of industry–education integration, the program will collaborate with JD Logistics to jointly develop a comprehensive suite of online courses—including theoretical courses in logistics management, digital technology courses, and practical training modules—designed to deliver the most advanced knowledge in logistics management and digital innovation.

Fifth, enhance the case-based curriculum framework and establish a digital case repository. In collaboration with JD Logistics, the project will co-develop a digital logistics management case repository, integrating JD Logistics' real-world operational cases, industry-standard logistics scenarios, and faculty research projects into the curriculum. Senior JD management personnel will facilitate case-based teaching sessions to deepen students' understanding of practical industry challenges.

Finally, implement virtual simulation-based pedagogy. Through immersive virtual simulations, students will engage with end-to-end logistics operations, enterprise management workflows, and real-world applications of digital technologies in a digital environment. This hands-on approach will strengthen students' practical competencies and problem-solving skills.

(4) Co-develop an applied teaching system through industry-education integration.

To cultivate advanced applied competencies in digital talent development for logistics management, this project will implement the following industry-education integration initiatives:

First, co-develop a dual-qualified faculty team through school-enterprise collaboration. The Logistics Management program will partner with JD Logistics to integrate JD's logistics operations and digital technology personnel into curriculum design and practical instruction. Professional faculty will undergo digital competency training and participate in on-site industry immersion at JD Logistics.

Second, establish a digital experimental-practical platform via industry-education integration. Leveraging JD Logistics' expertise in logistics operations, digital technology, human capital, and infrastructure, the university and JD will jointly develop a digital platform that transforms live operational cases into experimental modules and co-develops virtual simulation software. Students will experience real-time logistics operations and digital technology applications in complex scenarios through the platform.

Third, build an academic competition ecosystem. Logistics Management students will engage in faculty-led research projects, integrate competitions into theoretical courses, and collaborate with JD Logistics personnel as co-supervisors. Competitions will utilize JD's operational cases or industry research topics to enhance students' applied competencies and research capabilities through project-based learning.

Fourth, create an innovation-entrepreneurship competition platform. Under the industry-education integration framework, the Logistics Management program will co-build an innovation mentorship team with JD Logistics. Students will be encouraged to participate in discipline-specific competitions and flagship events like the "Internet+" and Challenge Cup, directly enhancing their innovation capacity, applied skills, and digital proficiency.

Fifth, co-establish student internship and training bases. A collaborative internship base will be jointly developed with JD Logistics, enabling Logistics Management students to conduct on-site internships across the full logistics operations cycle and digital technology application scenarios. This will significantly strengthen students' ability to apply theoretical knowledge in practice, elevating the quality of digital talent cultivation in logistics management.

(5) Establish a multidimensional, evidence-based assessment framework for digital talent cultivation in logistics management.

This project will construct a quality assessment system for digital talent training in logistics management from the following aspects based on the educational concept of school-enterprise integration of industry and education:

First, establish a multidisciplinary assessment committee. The Logistics Management program will co-establish a talent cultivation assessment committee with JD Logistics to evaluate training objectives, curriculum design, content, teaching effectiveness, experimental instruction, and assessment planning across multiple dimensions, ensuring the comprehensiveness, validity, and rationality of the talent cultivation system.

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Second, develop a full-process, evidence-based assessment index framework. Leveraging the digital teaching platform, we will establish a multidimensional assessment system covering theoretical examinations, classroom engagement, experimental practice, internships, case discussions, academic competitions, innovation-entrepreneurship, and ethical competence. This enables continuous formative assessment to ensure training quality and enhance applied competencies and innovation capabilities.

Third, implement multi-stakeholder assessment. This project will reform the current teacher-centered evaluation model by establishing a collaborative assessment panel comprising the university's Logistics Management program, JD Logistics, students, and industry representatives. Through this multi-stakeholder approach, the project will identify gaps between graduate competencies and industry demands for digital talent in logistics, and iteratively refine the digital talent cultivation system to enhance its relevance and effectiveness.

Fourth, establish an industry-based feedback mechanism. In collaboration with JD Logistics, a structured feedback loop will be implemented to evaluate the professional competencies of Logistics Management graduates in real-world operational contexts. The resulting insights will be systematically integrated into curriculum design, thereby driving continuous improvement of the digital talent cultivation system and enhancing training quality.

Finally, implement an evidence-based incentive mechanism. The college will co-develop a collaborative education incentive framework with JD Logistics, integrating faculty digital competencies, teaching effectiveness, and graduate outcomes in logistics management into performance evaluations. Outstanding digital teaching teams and students will be recognized through targeted rewards to reinforce high-quality talent cultivation.

4. Conclusion

This study confirms that industry-education integration is the core path to address the disconnection between logistics management digital talent training and industry demand. Cooperating with JD Logistics to build a "goal-curriculum-teaching-practice-assessment" five-in-one mode, it clarifies training directions (practical, cross-disciplinary integration, digital abilities), improves the talent training system, and enhances students' job adaptability while aiding the logistics industry's digital transformation. This mode has created digital characteristics for Nanjing University of Finance and Economics' logistics management major, providing demonstration value for similar majors in local universities. In the future, deeper school-enterprise collaboration and dynamic optimization of training programs are needed to align with industrial development.

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