

REFORM OF TRAINING MODE FOR LOGISTICS MANAGEMENT PROFESSIONALS IN APPLIED COLLEGES AND UNIVERSITIES UNDER THE BACKGROUND OF DIGITAL ECONOMY

YunZhu He, HanYang Chen, ShengBo Pan, ZiJing Lin*

College of International Economics & Trade, Ningbo University of Finance & Economics, Ningbo 315175, China.

Corresponding Author: ZiJing Lin, Email: linzijing@nbufe.edu.cn

Abstract: The digital transformation in the logistics industry has imposed new demands on cultivating logistics management majors in application-oriented universities. Revolutionizing the training model of logistics management majors to match the new requirements has become an issue that demands immediate solutions for application-oriented universities. For this purpose, we sort out the changes in demands for talents in the logistics industry empowered by the digital economy, analyze and summarize the existing problems in the cultivation of logistics management majors in current application-oriented universities, and put forward reform suggestions for the cultivation path, intending to provide a reference basis for the innovation of cultivation in the logistics management major of application-oriented universities.

Keywords: Digital economy; Logistics management major; Talent cultivation; Teaching reform

INTRODUCTION

In 2023, the scale of China's digital economy expanded to 53.9 trillion yuan, representing a year-on-year increase of 3.7 trillion yuan. This growth elevated its share of GDP to 42.8%, solidifying the digital economy as a critical pillar of the national economy. The advancement of internet technology and its pervasive application across society have positioned the digital economy not only as a vital engine for identifying new global economic growth points but also as an enduring force driving improvements in economic quality and deep structural optimization within industries[1]. Logistics serves as the foundational infrastructure of the digital economy, The realization and advancement of the digital economy rely on an efficient and comprehensive logistics system. The overall capacity of this logistics system directly influences the depth and extent of digital economic development[2]. The development of the digital economy has facilitated the rapid transformation and upgrading of the logistics industry[3]. In terms of infrastructure, logistics enterprises have introduced intelligent warehousing systems, automated sorting centers, and smart transportation networks to enhance operational efficiency and accuracy. Additionally, the adoption of drones and autonomous vehicles for last-mile delivery has significantly reduced labor costs while improving delivery speed and safety. In terms of operational coordination, empowered by the digital economy, network freight platforms have seen substantial advancements. These platforms not only integrate fragmented logistics resources to improve resource utilization and reduce transportation costs but also optimize transportation routes and vehicle usage, thereby reducing energy consumption and carbon emissions, promoting green logistics. Consequently, logistics enterprises are increasingly moving towards informatization, intelligence, and automation. The rapid development and digital transformation of the logistics sector have also created new demands for logistics management professionals that differ from those in the traditional logistics industry[4]. The proficiency in information technology, data analysis capabilities, and the extent of practical experience have become key considerations in the recruitment of logistics management professionals by logistics enterprises[5]. In the context of the high standards and stringent requirements imposed by the digital economy, the development and construction of undergraduate programs in logistics management at universities have become especially critical[6]. The proficiency in information technology, data analysis capabilities, and the extent of practical experience have become key considerations in the recruitment of logistics management professionals by logistics enterprises[7]. How to innovate the training model for logistics management majors in application-oriented universities to align with the current talent demands of the logistics industry has become an urgent issue that requires immediate attention. To address this, this paper will analyze the talent demand situation in the logistics sector under the influence of the digital economy, examine the challenges faced in the current training of logistics management professionals, and propose reform suggestions for the training pathways for reference[8].

1 ANALYSIS OF THE DEMAND FOR LOGISTICS MANAGEMENT TALENTS IN THE CONTEXT OF DIGITAL ECONOMY

Under the background of the digital economy, the logistics industry has undergone significant changes, gradually evolving towards intelligence, efficiency, and informatization. This has led to a transformation in the demand for logistics management talents, mainly manifested in an increased demand for compound talents, a decreased demand for

basic operation position talents, and an increased demand for talents with practical experience.

1.1 Increased Demand for Interdisciplinary Talents

According to statistics, the number of patent applications related to smart logistics in China in 2021 was 291, an increase of 84 compared to 2020. With the development of smart logistics, the demand for interdisciplinary talents in the logistics industry has also increased. Besides logistics management knowledge, logistics professionals are required to have information technology capabilities, data analysis skills, and cross-disciplinary knowledge. Specifically, it is manifested as follows: (1) Information technology capabilities: Firstly, modern logistics emphasizes operational efficiency and accuracy, which requires the use of modern information technology for real-time monitoring and optimization of the logistics process. For example, GIS and GPS. Secondly, contemporary smart logistics requires logistics professionals to master Internet of Things, cloud technology, etc., to promote the intelligence and automation of the logistics process and achieve the goal of reducing error rates. (2) Data analysis: Modern logistics often uses data analysis to optimize the allocation of logistics resources, identify waste in the logistics process to save costs. At the same time, the industry also uses logistics data analysis to predict future changes in logistics demand and market conditions based on historical data. (3) Cross-disciplinary knowledge: Contemporary logistics involves many disciplines such as management, economics, transportation, and computer science. Only by comprehensively applying these knowledge can contemporary logistics problems be solved.

1.2 Reduced Demand for Basic Operational Positions

With the development of the digital economy, the logistics industry is undergoing a digital and intelligent transformation, leading to a significant decrease in the demand for basic operational positions. Positions characterized by high repetition and low technical content are increasingly being replaced by automated equipment and intelligent systems. For instance, the advancement of intelligent warehousing has seen the widespread adoption of automated high-rise warehouse technology. By 2023, China's inventory of automated high-rise warehouses surpassed 10,000 units, significantly reducing the need for basic operational roles in logistics warehouses. Additionally, SF Express' fully automated transfer hubs, equipped with advanced sorting equipment, can handle the entire process from unloading at the station to sorting and loading, achieving nearly unmanned and fully automated sorting operations. This innovation has eliminated a substantial number of basic operational positions in the express delivery sector. It is evident that the reduced demand for basic operational positions is a clear trend in the logistics industry, driven by the empowerment of the digital economy.

1.3 Increased Demand for Talents with Practical Experience

For application-oriented universities, graduates from logistics management programs predominantly enter various functional positions in the logistics industry, such as transportation management, warehousing management, customs declaration, distribution, and customer relationship management. Under the empowerment of the digital economy, these positions not only require a solid grasp of basic logistics theoretical knowledge but also demand practical experience. In the recruitment process for these positions, logistics enterprises place greater emphasis on applicants' practical abilities, professional skills, and occupational qualities. Influenced by the broader economic environment, companies have significantly reduced their willingness to invest time and resources in training new employees. Instead, they prefer to hire individuals who already possess practical experience and can quickly adapt to the work environment and meet job requirements.

2 PROBLEMS IN THE CULTIVATION OF LOGISTICS MANAGEMENT TALENTS IN APPLIED COLLEGES AND UNIVERSITIES

2.1 The positioning of talent cultivation is disconnected from the demands of the industry.

With the widespread application of technologies such as big data, artificial intelligence, the Internet of Things (IoT), and cloud computing in the logistics industry, the structure of the logistics sector has undergone significant transformation. Business processes driven by these advanced technologies have been reengineered, leading to updates in job content, knowledge requirements, and technical standards. Consequently, logistics management professionals are now required not only to possess traditional logistics knowledge but also to master advanced technical skills. To ensure that graduates from application-oriented universities can rapidly adapt to market demands, it is imperative to redefine the representative job contents of the logistics industry, establish updated standards for professional competencies, and revise talent cultivation plans accordingly. However, many application-oriented universities still adhere to outdated curriculum frameworks and fail to make timely adjustments. While some institutions have introduced courses related to the digital economy, such as "Big Data Technology" and "Python and Big Data Analysis," these additions often lack full integration with the core logistics management curriculum. As a result, the students they produce struggle to meet the market's demand for high-quality, interdisciplinary logistics professionals.

2.2 Classroom teaching content and mode have not adapted to the development trend of the industry

With the digital economy empowering the logistics industry, the industry is undergoing rapid changes. The problem of lagging classroom teaching content and mode innovation in many applied universities has gradually emerged. The main manifestations are as follows: (1) The teaching content is overly theoretical, and the teaching cases are outdated. Currently, the logistics management major courses still focus on theoretical instruction, with few combinations of theoretical knowledge and practical cases. This results in students having theoretical knowledge but being unable to apply it in practice. The teaching cases mentioned in the course textbooks and teaching process are mostly outdated. For new models such as "smart logistics" and "unmanned warehouses", they are only briefly mentioned without in-depth explanation. This leads to students' knowledge lagging behind the industry development, increasing the barriers for students to enter the enterprise after graduation. (2) The teaching methods are monotonous, and the assessment mode has not kept up with the times. The teaching form of most courses still remains at the stage where teachers unilaterally teach through blackboard writing or PPTs. Under this mode, students' learning interest is low, and the teaching effect for practical content that requires hands-on mastery is also poor. Modern logistics places more emphasis on students' practical ability and independent problem-solving ability, making the innovation of teaching methods particularly important. At the same time, the traditional assessment method of combining regular performance with final exams is difficult to fully evaluate practical teaching content and students' ability to solve real problems. Therefore, innovating the assessment mode and breaking through the framework of fixed and single assessment methods is also an important issue that needs to be addressed in the education and teaching of the logistics management major in the context of the digital economy.

2.3 Lack of Innovation in Practical Teaching

Students majoring in logistics management in application-oriented universities mostly seek employment in logistics-related enterprises. Therefore, their practical abilities and the capacity to quickly adapt to job positions are particularly important. However, the current practical teaching models in most universities are insufficient in terms of both breadth and depth, making it difficult for students to meet the talent demands of enterprises. As a result, enterprises have to spend time, money and human resources to make up for the deficiencies of students. The problems existing in practical teaching mainly include: (1) The practical teaching model is monotonous. Currently, most universities complete off-campus practical teaching by arranging students to visit enterprises, participate in non-technical work in enterprises, and complete graduation internships. This makes it difficult for students to deeply understand and master practical operations, and also makes it difficult for them to discover and overcome problems arising in practical operations. This is not conducive to the cultivation of students' problem-solving abilities, nor does it help them have a deep understanding of the difficulties they may encounter in their future jobs. (2) Teachers have insufficient grasp of the industry's cutting-edge developments. Currently, universities have introduced a large number of high-level talents to undertake front-line teaching work. Most of them are doctoral students who have never worked in the front-line positions of logistics enterprises and thus have no understanding of the practical skills required by the positions. This limits the possibility of teachers' innovation in practical teaching. (3) Limited practical teaching resources. Some universities have insufficient investment in the update and expansion of practical teaching resources, resulting in outdated experimental equipment, limited training venues, and insufficient and uneven quality of off-campus training bases. These resource limitations severely restrict the innovation and development of practical teaching.

2.4 Inadequate Depth of School-Enterprise Cooperation

The logistics industry has undergone rapid transformation driven by the digital economy. School-enterprise cooperation is the optimal pathway for universities to promptly capture the latest developments in the industry. However, at present, most school-enterprise collaborations in universities remain superficial and lack substantive deep integration. Firstly, many colleges and universities' school-enterprise cooperation is limited to graduation internships and employment, while cooperation in core areas such as curriculum design, teaching methods, and research projects is relatively weak. This shallow cooperation model makes it difficult for schools to accurately grasp the latest developments in the logistics industry and integrate the latest industry knowledge and technologies into teaching in a timely manner, thereby affecting the quality of student cultivation. Secondly, the goals of school-enterprise cooperation are not clear. Colleges and universities do not have specific goals for school-enterprise cooperation, resulting in unquantifiable cooperation outcomes and hindering the iterative update of the school-enterprise cooperation model. Enterprises do not recognize the impact and significance of school-enterprise cooperation on their own development and cannot see the benefits of school-enterprise cooperation for themselves, thus lacking enthusiasm for it. Thirdly, there is a lack of effective communication platforms and exchange mechanisms between colleges and universities and enterprises. Schools have insufficient understanding of the actual needs and development trends of the logistics industry, while enterprises also lack a full understanding of the educational resources and teaching capabilities of schools. This information asymmetry makes it difficult for both sides to form effective complementarity and synergy in the cooperation process, thereby affecting the effectiveness of the cooperation.

3 REFORM SUGGESTIONS FOR THE TALENT CULTIVATION PATH OF LOGISTICS MANAGEMENT MAJOR IN APPLIED UNIVERSITIES

3.1 Deeply Revise the Talent Cultivation Plan

Conduct comprehensive research on enterprise demands and systematically analyze the specific changes in job positions and the structural shifts in talent requirements within the logistics industry during its transformation and upgrading. This process should meticulously examine the impact of industry changes on enterprise operational models, business processes, and organizational structures, thereby exploring the redefinition of job functions and responsibilities, as well as the evolving requirements for knowledge, skills, and competencies. Based on this analysis, thoroughly revise and enhance the existing talent cultivation plan to ensure it remains up-to-date and accurately reflects industry needs. Additionally, anticipate industry trends with a forward-looking perspective, staying ahead of actual enterprise development needs. The goal is to cultivate versatile talents proficient in logistics management while possessing cross-disciplinary knowledge and skills, enabling them to meet the challenges and seize the opportunities presented by the future logistics industry.

3.2 Optimize the Allocation of Teaching Staff

To enhance the quality of education in logistics management and cultivate high-quality talents that meet the demands of the digital economy era, it is necessary to comprehensively train the existing teaching staff. Specific measures include: (1) Strengthening professional skills training for teachers. For the teaching team, professional skills training should be intensified, not only focusing on the update of theoretical knowledge but also emphasizing the improvement of practical skills. Through regular organization of professional skills training, teaching workshops, and other activities, ensure that teachers can master and effectively impart professional knowledge, thereby enhancing teaching levels and quality. (2) Building a teacher development platform and deepening school-enterprise cooperation. Establish long-term and stable cooperative relationships with enterprises to provide teachers with diversified development platforms such as on-the-job training, enterprise lectures, and on-site visits. Through in-depth enterprise practice, teachers can keep up with the latest industry trends, understand the latest market demands and technological developments, thereby enriching and optimizing teaching content and enhancing the practicality and pertinence of teaching. (3) Enriching the composition of the teaching staff to achieve integration of industry and education. Actively recruit managers or engineers with rich logistics experience from enterprises to join the teaching team as part-time teachers or visiting professors. They will bring the latest industry information and practical experience to students, jointly design courses and guide practices with in-school teachers, achieving integration of industry and education and enhancing the effectiveness and innovation of teaching. (4) Implementing a dual-mentor system to promote the integration of learning and work. For senior students, assign both school and enterprise mentors to combine theoretical learning at school with practical work in enterprises, achieving an organic integration of learning and work. Through the joint guidance of dual mentors, students can better adapt to the social environment, smoothly transition to their careers, and enhance their employment competitiveness and career development potential.

3.3 Diversified School-Enterprise Cooperation Models

To deepen school-enterprise cooperation and enhance educational quality and students' practical abilities, the following measures can be taken: (1) Introduce an enterprise mentor teaching mechanism. Incorporate practical teaching elements into theoretical courses and invite enterprise mentors with rich industry experience to share industry trends, cases, and experiences through lectures and elective courses, thereby enhancing students' industry understanding, increasing their learning interest and practical abilities, and enabling them to better integrate theoretical knowledge with practice. (2) Implement diversified internship and training programs. Schools should actively collaborate with logistics enterprises to organize multi-level internship and training programs for students, ranging from enterprise visits to on-the-job internships, allowing them to deepen their understanding of the industry and accumulate practical experience through learning in the actual working environment of enterprises, and adapt to the workplace in advance. (3) Carry out joint school-enterprise project cooperation. Schools and logistics enterprises should cooperate on projects, such as jointly researching topics, solving practical problems, and developing innovative products or services, providing students with opportunities to collaborate with enterprises and promoting the development of their practical abilities and innovative thinking. (4) Host special lectures and exchange meetings. Invite front-line practitioners and senior executives from logistics enterprises to give lectures and hold exchange meetings for students, broadening their horizons and helping them better understand the latest developments in the industry. (5) Regularly hold cooperation exchange meetings and teacher training sessions. Schools should regularly organize cooperation exchange meetings, inviting representatives from partner enterprises to have face-to-face exchanges with teachers. By actively participating in relevant training activities of partner enterprises, teachers can enhance their practical abilities and industry understanding, better grasping the current demands of logistics enterprises. At the same time, such exchange meetings can also provide a platform for teachers to jointly discuss new ways of student cultivation in the era of smart logistics with enterprises. Through such a cooperation and exchange mechanism, schools can continuously optimize their teaching plans and methods to better meet the needs of industry development. (6) Development of virtual practice platforms. Schools can collaborate with

enterprises to build virtual practice platforms, breaking the time and space limitations of traditional teaching and providing students with more flexible and diverse learning experiences. This will offer students more convenient and efficient learning methods, improving their learning outcomes and practical abilities.

3.4 Innovative Practice Teaching Model

In the context of the rapid development of the digital economy, the practice teaching model for logistics majors urgently requires innovation to more effectively cultivate students' practical skills and innovative thinking. Specific measures include: (1) Integrating theory and practice to promote coordinated development. Practice teaching should not be regarded as a supplement to theoretical teaching, but should develop in coordination with it to form an organic whole. In the practice teaching of the logistics major, theoretical teaching content should be effectively applied to practice, enabling students to deepen their understanding of theory through practical operations and use theory to guide practice. For example, theoretical knowledge can be combined with practical operations through methods such as simulating logistics processes and case analysis to help students better master logistics knowledge and skills and improve their ability to solve practical problems. (2) Enriching the forms of practice teaching to enhance teaching attractiveness. For instance, organizing debate competitions to allow students to discuss hot issues in the logistics field; holding reading clubs to guide students to read classic works in the logistics major; conducting film-watching activities to have students watch documentaries or films related to logistics; and conducting social surveys to enable students to understand the current situation and development trends of the logistics industry. These diversified forms of practice teaching not only increase the interest of teaching but also allow students to learn and grow in a relaxed and pleasant atmosphere. (3) Establishing Practice Teaching Bases to Ensure the Smooth Progress of Teaching Activities. Practice teaching requires adequate resources and stable bases as support. To this end, colleges and universities should actively integrate practice teaching resources, leveraging both on-campus and local resources to establish relatively stable practice teaching bases. For instance, by forming cooperative relationships with local logistics companies, warehousing centers, ports, and other relevant entities, these bases can provide students with more practical opportunities and platforms, enabling them to learn and grow in real-world working environments. Simultaneously, the establishment of such practice teaching bases ensures a robust foundation for the smooth conduct of teaching activities. (4) Building an integrated practice teaching chain of industry-university-research-innovation. Practice teaching should not be limited to the campus but should also closely cooperate with external entities such as enterprises and research institutions. Colleges and universities should build an integrated practice teaching chain of industry-university-research-innovation, allowing students to come into contact with the latest scientific research achievements and industry trends in practice. For example, collaborating with logistics enterprises to carry out scientific research projects and having students participate to understand the latest technologies and applications in the logistics field; cooperating with research institutions to jointly conduct research and innovation in the logistics field. This cooperative model can not only enhance students' innovative thinking and practical application abilities but also provide more opportunities and platforms for their future employment and entrepreneurship.

4 CONCLUSION

Under the empowerment of the digital economy, the logistics industry is progressively advancing towards informatization, intelligence, and automation. Consequently, the demand for talents is shifting towards a more compound, innovative, and practice-oriented profile. This transformation poses significant challenges to the talent cultivation model in application-oriented universities' logistics management programs. Reforming the logistics management training model to align with contemporary industry demands has become an urgent priority for these institutions.

This paper comprehensively examines the entire process of talent cultivation in logistics management and proposes several strategic pathways for reform. These include: (1) deeply revising the talent training program to adapt to structural changes in talent demand; (2) optimizing the allocation of teaching staff to achieve seamless integration of industry and education; (3) diversifying school-enterprise cooperation models to enhance educational quality and students' practical abilities; and (4) innovating practical teaching models to cultivate students' practical skills and innovative thinking. It is anticipated that these recommendations will provide valuable insights and serve as a reference for the reform of logistics management talent cultivation in application-oriented universities within the context of the digital economy.

FUNDING

The research received funding by Ningbo University of Finance and Economics new liberal arts construction personnel training reform project [23xwkyb04], the Social Science Planning Fund Project of Liaoning Province [L21CGL003], the Ningbo Municipal Philosophy and Social Sciences Planning Project [G2023-2-43], the Special Research Fund for Master's Degree Application at Ningbo University of Finance and Economics [1320241221], and the "Innovative Research Base for the Integration of Digital Economy and Open Economy" of Zhejiang Soft Science Research Base.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

REFERENCES

- [1] Guo J. Research on the Impact of Digital Economy on the High - quality Development of the Logistics Industry - Taking Shaanxi Province as an Example. *Logistics Sci - Tech*, 2023, 46(24): 94 - 98.
- [2] Chang Shi-yin, Ma P, Cao L. Research on the Digital Transformation and Intelligent Upgrading of Logistics Management Majors in Industry Characteristics under the Background of the Digital Economy. *Logistics Engineering and Management*, 2024, 2(46): 122 - 125
- [3] Luo R, Wang Q. The Impact of Digital Economy in Chinese Cities on the High - quality Development of the Logistics Industry. *Urban Problems*, 2022(6): 35 - 46.
- [4] Jiang Y. Exploration on the Cultivation of Smart Logistics Talents in the Digital Economy Era. *Logistics Engineering and Management*, 2023, 45(12): 170 - 172.
- [5] Zhao L, Chen L. Analysis of the Cultivation of Data Literacy of Students Majoring in Modern Logistics Management under the Background of Logistics Digital Transformation. *Educational Observation*, 2023, 12(28): 40 - 43.
- [6] Jiang Shu-lei ,Zhang Z. The Development of the Digital Economy and the Upgrading of the Logistics Industry: An Empirical Examination Based on Innovation Mechanisms. *Journal of Commercial Economics*, 2020(22): 84 - 87
- [7] Xu N. Research on the Reform of the Talent Training Mode for Logistics Majors in Chinese Universities in the Big Data Era. *Logistics Sci - Tech*, 2023, 46(23): 151 - 152.
- [8] Zhao L. Innovation of Logistics Talent Training Mode from the Perspective of Industry - Education Integration. *China University Teaching*, 2021(12): 18 - 23.