Study on Practical Talent Cultivation Strategy for Smart Logistics

Xuejiang Wei, Meng Wang[*]

School of Logistics, Wuhan Technology and Business University, Wuhan, P.R. China
Corresponding author. Email: 13397195035@126.com

ABSTRACT

Modern logistics has entered the era of smart logistics which frees humans from (control) activities that can be delegated to smart products and services. Smart logistics has different requirements on training practical talents of logistics management in terms of talent type, knowledge structure, ability and quality. In this paper, we analyze the current situation of practical smart logistics personnel training in China and the requirements of logistics management talents in the context of smart logistics, put forward the training objectives of practical smart logistics management talents, and propose the training strategies for practical smart logistics talents, including updating the course content, improving teaching methods, and developing the cultivation model. This paper is only a preliminary thinking on the cultivation of practical smart logistics talents. In the future, we will further refine the strategy to improve its operability and test its effectiveness in the practice of professional construction.

***Keywords：** Talent cultivation strategy, Practical talents training, Smart logistics.*

1. INTRODUCTION

With the development and application of information technology in the domain of logistics, modern logistics has entered the era of smart logistics [1-3]. Smart logistics embraces smart services as well as smart products within logistics, and frees humans from (control) activities that can be delegated to smart products and services [4]. Compared with traditional logistics, smart logistics has three characteristics: intelligence, transparency and convenience [5]. Smart logistics plays an important role in economic construction and development, such as the integrator of social resources, the concentrator of decentralized market, the substitute of shortage of manpower and the creator of green ecology [6].

Smart logistics puts forward new requirements for logistics management talents in modern society,not only in quantity, but also in quality. According to the estimate by relevant departments, during the 13th five-year plan period in China, the demand for smart logistics talents in Jiangsu province alone is about 15,000 [7]. In this paper, we analyze the current situation of practical smart logistics personnel training in China and the requirements of logistics management talents in the context of smart logistics, propose the training objectives of practical smart logistics management talents, and put forward the training strategies for practical smart logistics talents.

2. ANALYSIS OF PRACTICALSMARTLOGISTICS TALENTTRAINING IN CHINA

2.1. Situation of Specialty Construction for Smart Logistics

According to the statistics of the Ministry of Education of China, 512 undergraduate universities and 1,039 vocational colleges offer logistics management majors, and 127 undergraduate universities and 18 vocational colleges offer logistics engineering majors, as shown in Figure 1.
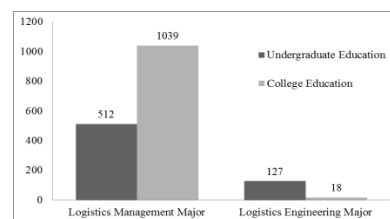

Figure 1 Statistics of logistics colleges and universities

In order to meet the demand of smart logistics talents in the logistics industry, some colleges and universities train talentsin the field of smart logistics, which can be divided into three cases.

2.1.1. Research-oriented Universities

Most research-oriented universities emphasize on the classic theory teaching of logistics rather than that of smart logistics, and only a few of them provide smart logistics courses, such as Beijing Technology and Business University, Xi 'an University of Science and Technology, Linyi University and so on.

2.1.2. Application-oriented Universities

Application-oriented universities pay more attention to the adaptability of talents and smart logistics posts, and some of them specially set up smart logistics direction, such as Wuhan Business and Technology University, Hubei College of Business and Commerce, Xi 'an Eurasian College, Zhicheng College of Fuzhou University, Ningbo Institute of Technology of Zhejiang University, Jincheng College of Sichuan University and so on. Some colleges and universities that have notset up the direction of smart logistics also propose to transform the traditional logistics major to the direction of smart logistics.

2.1.3. Vocational Colleges

Vocational colleges pay more attention to the operation and application of smart logistics equipment and technology in modern logistics, and most colleges take smart logistics as the key direction to promote the training of modern logistics operational and skilled talents. For example, Wuhan Engineering Vocational And Technical College, Zhejiang Economic Vocational and Technical College, Shandong Water Conservancy Vocational College, Shandong Medicine and Food Vocational College have done great efforts in smart logistics talents training, especially Shandong Medicine and Food Vocational College has built a specialized school to train smart logistics talents.

2.2. Situation of Curriculum Construction for Smart Logistics

To meet the needs of talent training in smart logistics, some colleges and universities have reformed the traditional logistics course system, and set uprelated courses for smart logistics such as Internet of Things and Smart Logistics, Smart Supply Chain Management, Smart Logistics Information Network, Smart Logistics Technology, Data Analysis and Mining, Big Data and Artificial Intelligence, and so on. However, the situation of curriculum construction for smart logistics cannot fully meet the needs of the need of smart logistics

majors. A large number of colleges and universities offering smart logistics courses still teach logistics courses in accordance with the traditional course system. The main reasons are as follows.

2.2.1. Lack of Professional Teaching Materials

Teaching materialsare the foundation of curriculum construction, but in the process of curriculum construction related to smart logistics, teaching materials construction is lagging behind the curriculum construction.

2.2.2. Lack of Specialized Teachers

In general, teachers inresearch-oriented universities focus on academic research rather than on teaching materials construction. Although teachers in other types of universities or colleges pay more attention to the construction of teaching materials, their own strength is relatively weak, so it is difficult to support the development and construction of the whole smart logistics curriculum system and teaching materials system.

2.3. Situation of Teaching Material Construction for Smart Logistics

Since it was proposed, smart logistics has been a hot issue in academic and industrial circles and a certain number of related books have been published every year except 2017 according to the statistics from Dangdang, as shown in Figure 2. However, it cannot meet the needs of curriculum construction for smart logistics, which is mainly reflected in the following aspects:

2.3.1. In Terms of Content

As shown in the left of Figure 3, 67% smart logistics related books are researched and analyzed from the perspective of monographs, which are frontier and exploratory. However, as teaching materials, they lack certain knowledge and systematicness, and are not suitable for teaching in terms of content.
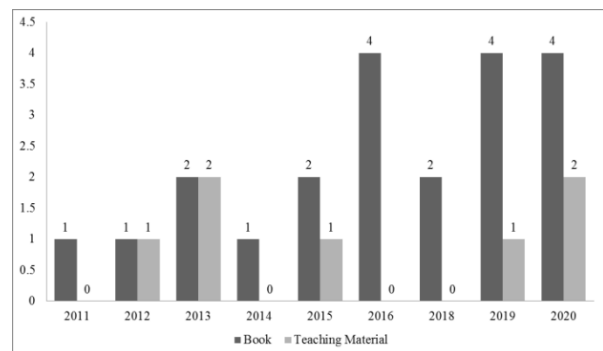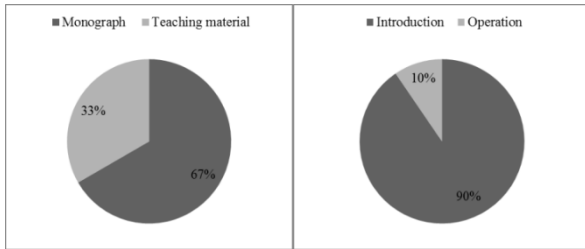

Figure 2 Statistics of smart logistics related books

Figure 3 Distribution of book types

2.3.2. In Terms of type

As shown in the right of Figure 3, 90% books focus on the introduction of smart logistics. However, there is a lack of books on smart logistics operation, such as smart logistics operation management, smart logistics system planning and design, smart logistics equipment and application, smart logistics technology and application, etc.

2.3.3. In Terms of Systematization

At present, there is no unified editorial committee to make a unified plan for the compilation of smart logistics related textbooks, which makes the textbooks lack of systematicness.

3. REQUIREMENTS OF SMART LOGISTICS FOR LOGISTICS TALENT

3.1. Requirement for Talent Type

Logistics talents are the important foundation to develop logistics and maintain the operation of logistics system [8]. In the context of smart logistics, it needs smart logistics talents which can be called high-end logistics talents, as well as traditional logistics talents. But it does not mean that the traditional logistics talents will be replaced by high-end logistics talents. On the one hand, smart logistics is the development of traditional logistics rather than the replacement of traditional logistics, so part of the work of smart logistics still relies on traditional logistics talents; On the other hand, to the transition stage of traditional logistics and transitional logistics enterprises, traditional logistics talents will still account for a large proportion of the staff.

3.2. Requirement for Knowledge of Talents

Smart logistics is an inevitable result of the development of information technology, and is the aggregation effect of many modern information technologies, such as the Internet of Things, cloud computing, big data and mobile Internet [9]. However, smart logistics is the result of the joint effect of technology application and management innovation rather than pure technology application [10]. Modern logistics theories and methods also play an important role in the development and operation of smart logistics. Therefore, in the context of smart logistics, the talents need to be familiar with the theory of logistics management such as basic management principles and scientific management methods, and have the ability to plan, organize, command, coordinate, control and supervise logistics tasks, to reduce logistics costs, improve logistics efficiency and economic benefits. Meanwhile, the talents need to be familiar with the related technologies and equipment of smart logistics, master the methods and approaches to apply them in the logistics system, and improve the automation and intelligence level of modern logistics.

3.3. Requirement for Ability of Talents

Different from traditional logistics, smart logistics has the functions of context awareness, resource integration, intelligent analysis, optimization decision, automatic adaption and active feedback [11]. In the context of smart logistics, the logistics talents need the ability that match the functions of smart logistics, which can be divided into practical skills and innovative thinking. the practical skills include the ability of applying logistics technology, operating logistics equipment and related software, optimal scheduling, collaborative decision-making, and exploiting logistics data benefits. The innovative thinking refers to collaborative innovative thinking, resource-sharing thinking, energy conservation and emission reduction awareness, and green development awareness.

4. TRAINING OBJECTIVES OF PRACTICAL SMART LOGISTICS TALENTS

According to the demand for logistics talents in the context of logistics, we propose the training objectives of practical smart logistics talents, which can be divided into smart logistics business operation ability, smart logistics system management ability and smart logistics system planning and design ability.

4.1. Smart Logistics Business Operation Ability

The smart logistics business operation ability is the basic ability of practical smart logistics talents, and it meets the basic needs of practical smart logistics talents for graduation and employment. Smart logistics business operation ability includes: (1) Be familiar with the operation process and main work of warehousing, transportation, distribution, sorting, loading, unloading and handling, freight and other businesses in smart logistics, capable of completing practical business work; (2) Be familiar with the main business and operation process of smart logistics nodes, such as smart logistics park, smart port, and smart logistics transfer center, and

preliminarily capable of carrying out relevant work; (3) Be familiar with the performance and operation methods of typical smart logistics equipment and facilities, and preliminarily capable of operate and use the smart logistics equipment and facilities; (4) Be familiar with the basic functions and operation process of common smart logistics management information system/platform, and preliminarily capable of use the smart logistics information system.

4.2. Smart Logistics System Management Ability

The management ability of smart logistics system which is the core ability of practical smart logistics management talents, can be divided into: (1) Be familiar with the basic theories and knowledge of mathematics, computer, operations research, management, economics and so on, and be able to analyze and solve related problems in the field of smart logistics management with the theories and knowledge; (2) Be familiar with the basic theories and methods of traditional logistics management, understand the new theories and methods of smart logistics management, and be able to apply relevant theories to solve practical problems of smart logistics management; (3) Be familiar with the function and performance of smart logistics facilities and equipment, and be able to manage the facilities and equipment;(4) Be familiar with the characteristics and operation modes of smart logistics links or nodes such as smart warehousing, smart transportation and distribution, smart logistics park and smart port, and have corresponding operation and management capabilities; (5) Be familiar with smart supply chain thinking and methods, and be able to manage smart supply chain.

4.3. Smart Logistics System Planning and Design Ability

The planning and design ability of smart logistics system which is based on the improvement of operation and management ability, includes: (1) Be familiar with the theories and methods of traditional logistics system planning and design, and be able to solve practical problems in the field of logistics system planning and design; (2) Be familiar with the development status and trend of smart logistics, and be able to innovate in the development of smart logistics; (3) Be familiar with smart logistics technologies such as Internet of things, cloud computing, big data, mobile Internet and artificial intelligence, and be able to apply these technologies in smart logistics; (4) On the basis of being familiar with the operation process of various specific businesses in smart logistics, and be able to optimize the workflow of smart logistics; (5) On the basis of being familiar with the usage and performance indexes of common smart logistics facilities and equipment, and be able to apply

the facilities and equipment in smart logistics; (6) Master the basic methods and means of smart logistics information management, be familiar with the basic structure, functional modules and business process of smart logistics information system, and preliminarily be able to design and develop smart logistics information system.

5. TRAINING STRATEGIES FOR PRACTICAL SMART LOGISTICS TALENTS

According to the training objectives, we put forward the training strategies for practical smart logistics talents.

5.1. Strategy of Updating the Course Content

Though smart logistics is different of traditional logistics, such as the degree of automation and intelligence, the essence of smart logistics is the same as that of traditional logistics, for it is developed from traditional logistics, and is the upgrading and transformation of traditional logistics. According to the relationship between smart logistics and traditional logistics, we propose a layered replacement strategy to gradually update the course content.

As shown in Table 1, for the classical public basic courses such as Economic Mathematics, Management, Operations Research and Economics, the original curriculum system and content should be kept unchanged. For the classic professional basic courses such as Introduction to Logistics Management, Science of Goods, Logistics Cost Management, Supply Chain Management, Logistics System Engineering, Logistics System Planning and Design, the original curriculum system should be kept unchanged too, but part of the content should be replaced according to the development of smart logistics. For the major course such as Logistics Facilities and Equipment, Logistics Information Technology, Production Operation and Management, the content should be reorganized according to the actual situation of smart logistics. For practical courses such as Warehouse Management Practice, Transportation Management Practice, Distribution Management Practice, Warehouse Planning and Design, the content should be completely replaced according to the practical business of smart logistics. Meanwhile, in order to enhance the operation ability of talents of the new mode and new businesses under the environment of smart logistics, it is necessary to add cognitive and specialized operation courses of smart logistics.

Table 1. Strategy of updating the course content

Course Module	Main Course	Strategy
Public basic course	Economic Mathematics, Management, Operations Research and Economics.	Remain
Professional basic course	Introduction to Logistics Management, Science of Goods, Logistics Cost Management, Supply Chain Management, Logistics System Engineering, Logistics System Planning and Design.	Replace partly
Major course	Logistics Facilities and Equipment, Logistics Information Technology, Production Operation and Management.	Reorganize
Practical courses	Warehouse Management Practice, Transportation Management Practice, Distribution Management Practice, Warehouse Planning and Design.	Replace completely
Specialized courses for smart logistics	Introduction to smart logistics, Smart Logistics Operation and Management, etc.	Add

5.2. Strategy of Improving Teaching Methods

Teaching methods such as project-type, case-type and discussion-type play an important role in the training of practical talents, which are also applicable to the training of practical smart logistics talents. However, they are needed to be adjusted according to the characteristics of the training objects. First, the content should be closely combined with the actual situation of smart logistics, and the designed projects and selected cases should be typical and forward-looking. Second, in the specific implementation, it should pay attention to the dual cultivation of skills and thinking, which not only trains talents' ability to solve practical problems of smart logistics by using basic theoretical knowledge such as economics, management, operations research, smart logistics technology and equipment, but also trains talents' smart logistics thinking such as big data and collaborative sharing. At last, it is needed to pay attention to the combination of process and result in the way of evaluation by recording and analyzing the process to find out the problems in talents' thinking mode and guide talents to solve the problems.

5.3. Strategy of Developing the Cultivation Model

According to the characteristics of smart logistics talents, the cultivation model of training smart logistics talents focus on three combinations, including the combination of general and professional skills, the combination of school training and enterprise practice, and the combination of learning and research. To achieve the first combination, it is necessary to divide the college learning process into two stages, which in the first stage it focus on general education and the accumulation of basic professional knowledge, and in another stage talents are allowed to choose their own development direction according to their interests and abilities. To realize the second combination, it is necessary to jointly hold named classes, order classes or enterprise colleges with smart logistics enterprises, so as to make full use of the resource advantages of enterprises, and to make the talents to better meet the needs of enterprises. To meet the last combination, it is necessary to encourage talents to actively participate in various logistics competitions and apply for provincial-level and university-level scientific research and innovation projects, and some talents can also be recruited to participate in teachers' project research, so as to strengthen the cultivation of talents' innovative thinking and innovation ability.

6. CONCLUSION

In this paper, we firstly analyze the current situation of practical smart logistics personnel training in China from three aspects: specialty construction, curriculum construction and teaching material construction, and find out the development of smart logistics talent training cannot meet the needs of smart logistics personnel, so it is necessary to adjust the talent training strategy of according to the development of smart logistics.

In part II and III, we analyze the requirements of smart logistics for logistics talent and the training objective of practical smart logistics talents including smart logistics business operation ability, smart logistics system management ability and smart logistics system planning and design ability. Finally, we put forward the strategy of cultivating practical talents of smart logistics from the aspects of updating course content, improving teaching methods and developing cultivation mode.

This paper originates from the actual needs of our specialty construction, and the research results will also be applied to the actual specialty construction. Of course, the results of this paper is only a preliminary thinking on the cultivation of practical smart logistics talents. On the one hand, the talent cultivation strategy needs to be further refined to be operable; on the other hand, the strategy need to be checked whether is effective in the practice of practical talent cultivation for smart logistics.

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