Research on Teaching Reform Integrating Information Technology Innovation -- A Case Study of Logistics Information Technology and Management Course

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Abstract: "Logistics Information Technology and Management" is a core course for the major of logistics management and logistics engineering. It plays an important role in the curriculum system of logistics specialty. In order to promote the rapid development of the logistics major, this paper starts from the teaching innovation and reform of the course, based on the integration of information technology such as frontier big data, cloud technology and artificial intelligence, and based on the teaching syllabus, firstly defines the training objectives of the logistics engineering major from four aspects: educational standards, professional standards, social needs and school-running characteristics. Then, according to the training objectives and the 12 graduation requirements of logistics engineering, the curriculum objectives of Logistics Information Technology and Management are formulated, and the curriculum content is re-integrated and integrated into the curriculum ideology and politics. Finally, the teaching evaluation system is reconstructed. This paper attempts to explore a set of teaching reform plan suitable for the training objectives of logistics majors, so as to lead students to keep up with the pace of the development of logistics industry.

1. Introduction

In recent years, the rapid development of the logistics industry and the continuous development of the Internet, big data, artificial intelligence and other technologies integration, intelligent logistics came into being. The operation and management of logistics are becoming more and more informationized, automated, networked, visualized, controllable and intelligent. With the application of intelligent technologies such as artificial intelligence, big data analysis, drones, unmanned warehouses, and unmanned vehicles, logistics enterprises have higher standards and

requirements for logistics talents, and the demand for composite and applied logistics talents continues to increase. The job requirements of smart material flow management, smart logistics technology, and smart logistics operation are also increasingly focused on the application ability of logistics information technology. Logistics Information Technology is a core professional course for logistics management majors in colleges and universities. According to the development background and trend of intelligent logistics in the logistics industry, colleges and universities should analyze the training needs of intelligent logistics talents, reform the teaching objectives, teaching content, teaching process and evaluation feedback system of the course. Cultivate application-oriented intelligent logistics talents who adapt to the new era, new dynamics and new needs.[1]

2. Current Situation and Problem Analysis of Logistics Information Technology and Management Course

2.1 Current Situation Analysis

In recent years, there have been some achievements in the curriculum reform of modern Logistics Information Technology in China. For example, under the guidance of the national "Internet +" strategy, Yao Jiangbo analyzed the demand for talent ability in the logistics industry through market research, and designed the "Internet + logistics" teaching reform case based on the project-based teaching method. Wang Junfeng et al. analyzed the deficiencies in the teaching process of Logistics Information Technology through literature research and interviews, and put forward reform suggestions based on the "Internet +" teaching concept applicable to the training goals of logistics talents in higher vocational colleges. Zhu Jianping paid more attention to the reform of the curriculum practice content, using Internet technology to improve students' hands-on practical ability through science and innovation projects. In view of the problems in Logistics Information Technology under the background of intelligent logistics, Zhao Ying proposed optimization and reform measures from four aspects: teaching objectives, teaching content, teaching process, teaching evaluation and feedback. CAI Hui et al. focused on analyzing the problems existing in the logistics information technology course materials, combined with the needs of course-related jobs, divided the course learning tasks from different job roles, and integrated the course ideological and political elements into the design of the teaching syllabus to comprehensively improve students' literacy. Ji Jingna analyzed the problems faced by the course "Logistics Information Technology and Application" from the three aspects of teaching materials, teaching and teachers, and put forward the corresponding reform plan from the aspects of teaching content, teaching method, teaching design and teacher team construction. However, the above reform plans and proposals still lack the demonstration of practical application effects. In order to solve the contradiction between theory and practice, Wu Zhong et al. focused on the reform of teaching methods, combined the "interactive" teaching method and the "team" teaching method, paid attention to the personalized development of students, and invited experts, scholars and students to evaluate the effect of teaching reform. Ren Qijun uses the network resources to carry out the mixed teaching mode combining online and offline, and carries on the follow-up evaluation to the later implementation effect of the course design. Cao Guangqiu used the mobile learning platform "Super Star Learning Tong" to innovate mobile teaching design, get the learning effect of students' feedback, and finally evaluate the reform effect through controlled experiments [1].

2.2 Problem Analysis

(1) The course objectives are not clear

Training applied logistics talents is the basic orientation of logistics major training in applied colleges and universities. However, in terms of the current teaching standards of logistics information technology courses, from the establishment of knowledge objectives, skill objectives and quality objectives, more emphasis is placed on the theoretical learning and operational application of the existing classic logistics information technology, and the cultivation of the actual control ability, application analysis ability and innovation ability of the latest intelligent technology in the logistics industry under the background of smart logistics is ignored. It cannot meet the new demand for logistics talents under the background of intelligent logistics.

(2) The teaching content is outdated

The teaching content is old and does not meet the development needs of the new generation of logistics technology talents: the bar code technology, RFID technology, GPS and GIS spatial information technology in the modern logistics information technology course are still the foundation of the logistics industry informatization construction, and the mastery of these knowledge points can meet the requirements of the informatization development of most logistics enterprises. However, with the development of a new generation of information technology, the intelligence level of the logistics industry has also made a qualitative leap, and the demand for logistics science and technology talents is no longer satisfied with the mastery of basic information technology. However, at present, the theory and application of the new generation of information technology has not been incorporated into the teaching, and the course content cannot keep up with the development of The Times, and it is difficult to train high-quality talents to meet the needs of intelligent development of the logistics industry [2].

(3) Single teaching mode

The teaching mode based on classroom teaching is difficult to cultivate students' ability of independent learning: In the training program of logistics engineering major of Haojing College of Shaanxi University of Science and Technology, the course "Logistics Information Technology and Management" is 48 hours, all of which are theoretical hours. In the whole teaching process, teachers mainly teach. Although there are many network teaching methods to increase the interaction between teachers and students, the utilization rate is not high, and students are still in a passive state of learning knowledge, and do not give full play to the subjective initiative of learning [1].

(4) Teaching evaluation methods are not rich enough

The single means of teaching evaluation is not conducive to teachers' reflection on teaching, and cannot meet the diversified development needs of students: At present, the final exam of Logistics Information Technology and Management is still dominated by closed-book written examination, and the exam content focuses on objective questions, such as filling in the blank, choice, judgment, short answer, etc., and it rarely involves open questions of case analysis. This assessment method not only fails to assess students' practical innovation ability, but also is not conducive to cultivating students' ability to combine theory with practice. Moreover, the teaching effect is not good, because students only need to review the test paper before taking the test to get ideal results, and teachers cannot judge students' actual mastery of knowledge points through the test paper. It is difficult to reflect on the teaching process objectively [5-6].

3. "Logistics Information Technology and Management" Curriculum Reform Plan Design

3.1 Curriculum Reform Ideas

First of all, according to the four aspects of education standards, professional standards, social needs and school-running characteristics, the mind map of logistics engineering is formulated, so as to determine the training objectives of logistics engineering. Then follow up the training objectives

combined with the 12 graduation requirements of logistics engineering, formulate the course objectives of Logistics Information Technology and Management; Then the first, second and third level matrices of the course are designed according to the course objectives. In the process of designing the three-layer matrix, the course content is reorganized according to the form of the project, combining the information technology to innovate the teaching method, adding practical links, and enriching the ideological and political content of the course. Finally, the teaching evaluation feedback system is reconstructed to master the teaching quality. The specific ideas and methods are shown in Figure 1-1 below [7-8].
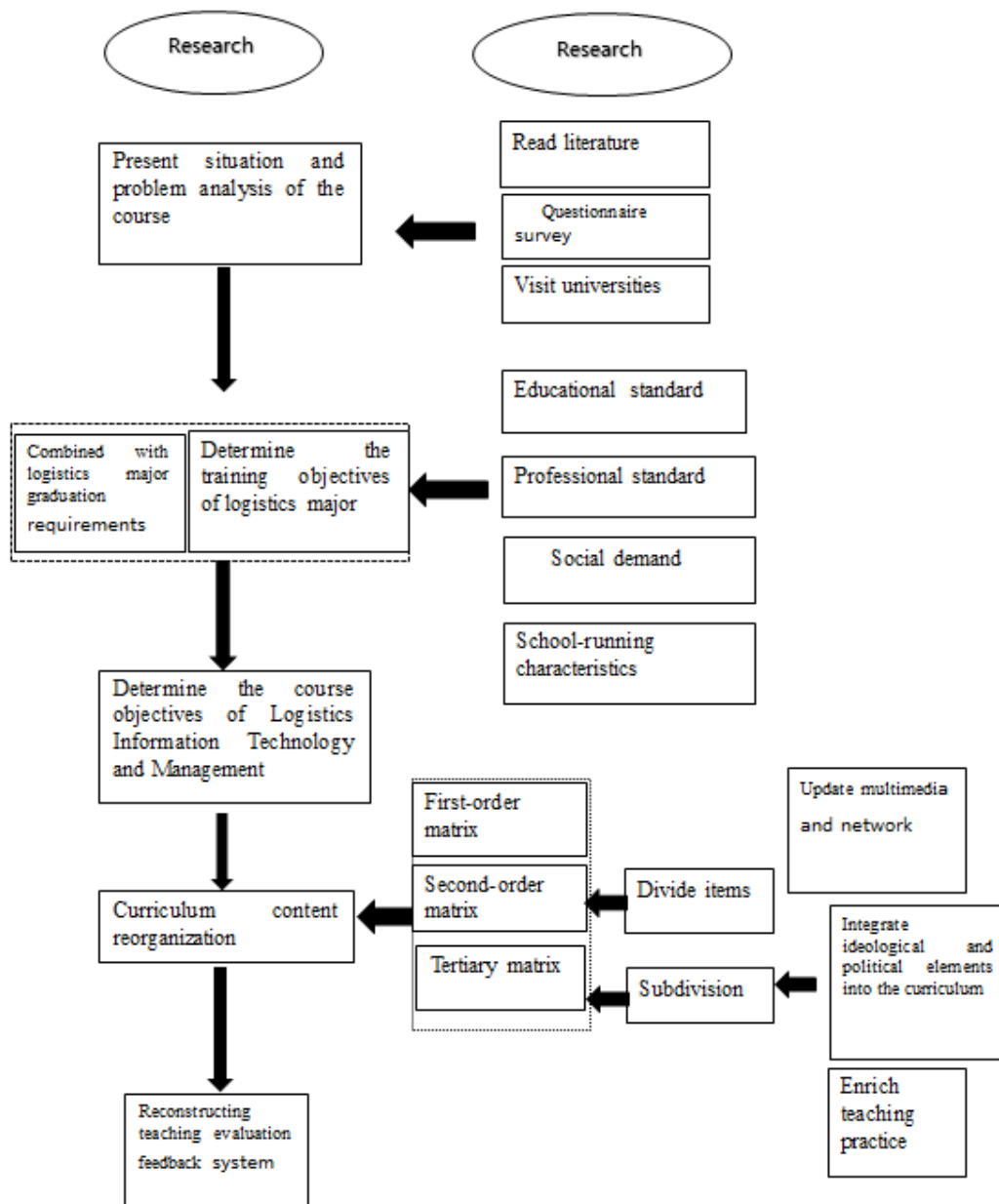

Figure 1. Curriculum reform thinking system diagram

3.2. Optimization of Course Objectives

In the context of continuous innovation of information technology, the development of logistics

information technology is changing with each passing day. The teaching goal of Logistics Information Technology and Management course should cater to the development trend of The Times. Through the investigation of the actual needs of enterprises, combined with the professional development direction and professional personnel training program of the school, students can be trained on the basis of mastering the principles of logistics information technology. Enhance the application ability, analysis ability and innovation ability of information technology, especially the learning and application of logistics frontier technology, cultivate students' big data thinking, Internet thinking and integrated application ability of logistics information technology, so that students can combine theory with practice and propose advanced logistics information technology solutions according to the specific situation of enterprises. Comprehensively improve the ability to acquire knowledge, understand knowledge and use knowledge. The construction of teaching objectives of the course is shown in Table 1[3].

Table 1. Teaching objectives of Logistics Information Technology and Management course

Goal	Content
Knowledge objective	Logistics information technology (bar code technology, RFID, EDI, GPS, GIS, etc.)
	Logistics information system
	Logistics information platform
	Big data, cloud computing, blockchain, AI
	Internet of Things
Skill objective	Logistics management software operation and application ability
	Logistics information system function development and design ability
	Logistics information technology scheme design ability
Quality goal	Innovation ability
	Cooperative ability
	Big data and artificial intelligence thinking

3.3. Curriculum Content Reconstruction

According to the concept of OBE, the content of the theoretical system and practical system of the logistics information management course is reorganized, and the phased results are set by modules. Based on the original courses, the theoretical system and practical system corresponding to the modules are updated and filled according to the needs of enterprises, as shown in Table 1 [9-10]. As can be seen from the table, the concept of OBE emphasizes the research-based teaching mode, so requirements for phased results are first set after each module. The content involved in the module is not "taught" by teachers to students, but encourages students to take the initiative to understand and learn under the setting of phased results. In terms of theoretical system, it breaks through the restrictions of traditional teaching materials, and adds explanations of relevant

technologies for practical application of enterprises such as blockchain, Internet of Things, big data, cloud technology and AI. Special modules and content design are carried out for practical majors, such as cold chain logistics, which requires learning of product traceability and related technologies. In terms of the practical system, in addition to the traditional on-campus experiments, enterprise practice and information construction bidding and other enterprise scenarios are also included, so that the practical content can better support and consolidate the theoretical system, as shown in Table 2 below [3].

Table 2. Course content reconstruction

Project name	Stage result	Theoretical system		Practice system
Logistics information and management	Logistics informatization research	Information, logistics information, information technology, information management, logistics information management, information system management		Enterprise and industry research
Logistics information system technology	Logistics information technology	Collection technique	Bar code, RFID	Barcode coding and production and database basic experiments
		Transmission technology	EDI, Network	
		Storage technology	Database, blockchain	
		Tracking technique	GPS、GIS	
		Cutting-edge technology	Internet of Things, big data, cloud computing, AI	
Logistics information system	Logistics information system and platform design	Common logistics information system	WMS、TMS、TDS、	Warehousing, transportation, distribution and express system operation, enterprise information system practical operation
			ERP	
			Logistics information platform	
			Cold chain logistics traceability system	
	Logistics information system implementation	Logistics information system design and development		Logistics information system construction bidding

On the basis of the design of the theoretical system, the ideological and political content of the course is integrated at the same time. For example, in the logistics information and management part of the course content reconstruction, "logistics black technology" is introduced for the understanding of logistics information technology and logistics information standardization, from "Beacon fire reporting military intelligence to flying pigeon book delivery to post station delivery to the Internet". The standardization of logistics information introduces the historical story of "the same track, the same text and the same wheel" in the Qin Dynasty; Collect the entrepreneurial story of Wang Yue, the father of two-dimensional code, and the R&D case of Huawei's chip in information technology; In the logistics information system part of the introduction of Kyushu Tong war epidemic story; In the tracking technology, the importance of the United States GPS in the Gulf War and China's Beidou were introduced [11]. Through the integration of ideology and politics in the curriculum, students can understand the development and application of technology to truly

realize the effect of learning, as shown in Table 3 below.

Table 3. Curriculum ideological and political integration [4]

Teaching content	Ideological and political integration	Suggested teaching method
Knowledge of logistics information technology	1. Through the drone delivery case, understand the logistics black technology during the epidemic, let students realize the social value of logistics technology in the black Swan event, and learn the application of technology can not only settle down, but also solve problems for the society. Stimulate learning motivation. 2. By learning the evolution process of information transmission, from "Beacon fire reporting military situation to flying pigeon transmission, post delivery to the Internet and then to the development of mobile Internet, it shows that technological progress pushes the development of society, inspires students to establish a concept of development, learn without end, and guide the concept of lifelong learning. 3. By investigating the current situation of logistics enterprise informatization in groups, cultivate team spirit and leader leadership, and let students truly experience and learn from practice.	Case teaching + group discussion + enterprise research
Understand logistics information standardization	1. Let students realize the significance of standards through the historical story of "the same track, the same text, and the same wheel" in the Qin Dynasty. Although the Chinese nation has experienced vicissitudes, it has always been unified, and it also benefits from unified standards, which inspires students to respect the wisdom of ancestors and respect the patriotic feelings of tradition, and feel proud of the long Chinese civilization. 2. By querying information coding standards, ISBN and ISSN can be distinguished from authenticity, combat piracy, safeguard intellectual property rights, and strengthen socialist rule of law awareness.	Case teaching + brainstorming + practical operation
Master information gathering techniques	1. Let students understand the trust crisis caused by barcode abuse through videos and cases, guide students to establish a sense of rule of law, safety awareness, and scientific and technological ethics, have a sense of mission to solve social problems by using barcode technology, and design barcode to realize the integration of knowledge and action. 2. Through the entrepreneurship story of Wang Yue, the father of the two-dimensional code, to stimulate students' entrepreneurial spirit and fighting spirit, through the story of the data man behind the health code, 40d completed 30 code iterations, and there was a health code in the early stage of the epidemic, stimulating students' sense of responsibility and enterprising spirit.	Group collaboration + brainstorming + extracurricular practice + knowledge competition
Learn to apply RFID automatic identification technology	1. The case of Huawei chip research and development illustrates the pain of "no core" in the domestic science and technology industry. Although China's chip technology research and development has made great progress, it still lags behind developed countries, and the development of science and technology is hindered and long. 2. Through the difficult process of promoting RFID in Walmart, students understand the unity of opposites of contradictions, which are interdependent and permeable. RFID simplifies logistics operations, fast and efficient, but since the promotion of RFID by Walmart in 2003, after all, due to the two major problems of high cost and non-unified standards, it has not been large-scale application so far, so that students should consider the problem from many aspects to avoid one-sided and extreme.	Case teaching + practical operation + knowledge competition
Understand electronic data interchange technology	By comparing the difference in the amount of paper used in international trade before and after the implementation of EDI customs declaration, students are guided to realize the value of EDI technology. The customs declaration materials are repeatedly entered into a large number of printing enterprises, which is time-consuming and costly, and EDI paperless operation is adopted, which saves labor and paper, and implements the awareness of environmental protection and sustainable development.	Case teaching
Master logistics information system	1. Handled the donated warehouse materials through 2h -- the story of the Kyushu Epidemic, felt the responsibility of logistics personnel under the epidemic, and made students realize the power of logistics information system and increase their professional confidence. 2. By operating the warehousing system and freight management system, writing and laying the underlying data, cultivating students' professional qualities of respecting the rules, studying the rules and being willing to bear hardships.	Case teaching + group collaboration + practical operation
Master logistics dynamic tracking technology and application	1. During the Gulf War, the United States turned off the GPS and the war command was in a panic. Let the students realize that the core science and technology is the important tool of a big country, and the young people have to strive for self-improvement, in order to realize the national rejuvenation. 2. Promote the scientific spirit and inspire national pride through the development of Beidou satellite navigation.	Case teaching + group discussion

3.4. Reconstruction of Evaluation and Feedback System

In terms of assessment of learning results, in addition to traditional exams, the assessment of students in the process should be strengthened, such as continuous tracking and monitoring of the participation enthusiasm and completion of phased results, classroom performance, group discussion, etc., especially the knowledge point detection of each class, quantification of process data and timely publicity, so that students can see their shortcomings in real time and learn to self-check and fill in gaps. Instead of relying on final endorsements. In the evaluation of teaching results, the combination of short-term and long-term form is used to continuously monitor the consistency of learning output effect and expected effect. In the short term, through the discussion of the students in the course of study, the questionnaire of the students who have completed the course and other forms, to discover the shortcomings of teaching and timely improvement. In the long term, open up the channels of teachers and students in schools and enterprises, and carry out follow-up surveys and unit performance evaluations on students engaged in related fields, as shown in Figure 2 below [12].
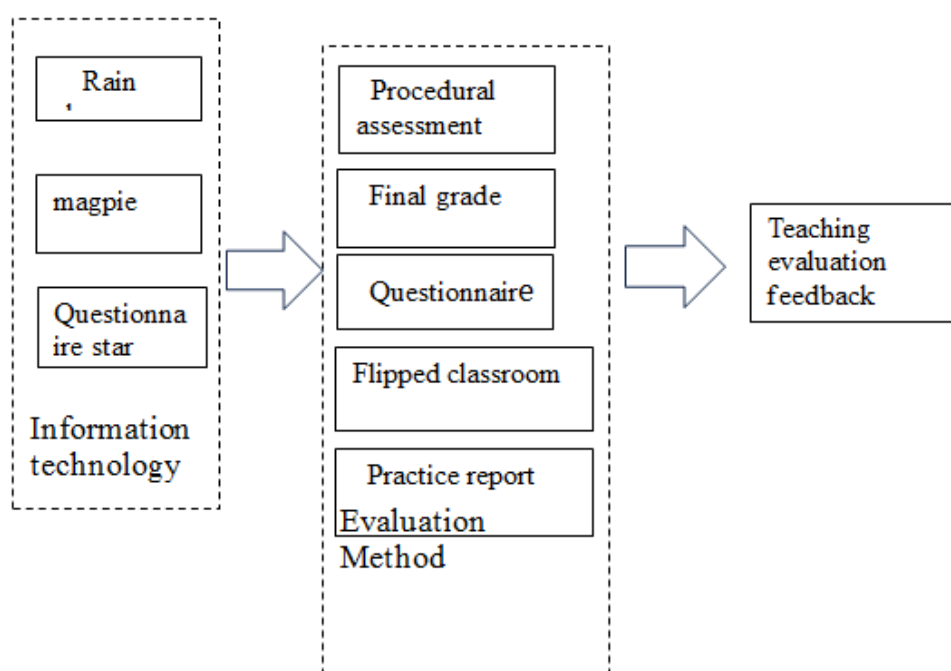

Figure 2. Evaluation feedback system diagram

4. Conclusion

In the era of "Internet + logistics" and artificial intelligence, keeping up with cutting-edge technologies of The Times, updating teaching content, improving students' practical ability, accurately feedback teaching effectiveness, and cultivating diversified, integrated and high-end talents in the material flow industry are the top priorities in the course construction of "Modern Logistics Information Technology". Based on the background of integrating into cutting-edge information technology, this paper, based on the teaching syllabus, defines the curriculum objectives, restructures the curriculum system, integrates into curriculum ideology and politics, etc., in order to enhance students' interest in learning, promote thinking, master cutting-edge knowledge, and strengthen ideological and political education by strengthening interaction. Students can not

only understand the basic concepts, basic knowledge and basic operational skills of logistics information technology, but also better understand how to apply logistics information technology in modern logistics, and make it play a role, so as to cultivate more talents in line with the needs of modern logistics industry, and better realize the cultivation of morality and people.

Acknowledgement

References

[1] Hu Bing, Sun Zhixin. Research on the teaching reform of "Multi-dimensional and three-dimensional" course of Modern Logistics Information Technology, Logistics Technology, 2022 (8) : 173-177.

[2] Wang Ning. Ideological and Political construction and practice of "Logistics Information Technology and Application", Logistics Technology, 2022 (2) : 133-140.

[3] Zhao Ying, Exploration on the teaching reform of logistics Information technology under the background of intelligent Logistics *, Logistics Engineering and Management,2020(2):168-170.

[4] Ji Jingna, Yan Xiao. Curriculum reform and practice of Logistics Information Technology and Application, Logistics Science and Technology, 2022 (2) : 173-177.

[5]Chang Liu. Research on the Reform of Logistics Information Technology Teaching Under the Background of "Intelligent Logistics" ,The Educational Review, USA, 2023.12.023:23-28.

[6]Lu Rong. Information Age, Artificial Intelligence and Virtual Reality Technology are Integrated with Logistics Teaching Reform, Forthcoming Networks and Sustainability in the IoT Era:Second International Conference,2022, 228-232.

[7]Qing Shi. Research on teaching reform of logistics talent training mode under the background of digital economy,Region - Educational Research and Reviews,2023,56-62.

[8]Chunling Wei. Exploration of practical teaching reform of logistics specialty in higher vocational colleges under the background of artificial intelligence, Modern Management Forum,2023,124-131.

[9]Bei Jiang. Research on the Integrated Teaching Reform Method of Logistics Management in Higher Vocational Education,2023 6th International Conference on Economics, Management Engineering and Education Technology,2023,235-261.

[10]Yi Ai. Reform of Logistics Education and Teaching from the Perspective of"Mass Entrepreneurship and Innovation", Advances in Higher Education,2023,37-44.

[11] Liu Yanhui; Lian Jinxiang; Zhou Xiaoguang; Fang Liang. OBE Oriented Teaching Reform and Practice of Logistics Information System Under the Background of Emerging Engineering Education, Advances in Artificial Systems for Logistics Engineering III, 2023, PP 777-786.

[12] Yang Qin. Exploration on Teaching Reform of Railway Container Transport Under the Background of Intelligent Logistics, Advances in Artificial Systems for Medicine and Education VI, 2023, PP 500-509.