



From the Perspective of Symbiosis Theory, The Coupling of the Collaborative Education Mechanism of the “Dual-Qualified” Teachers in the Logistics Specialty of Higher Vocational Colleges

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Abstract. In the new era, higher vocational colleges need to implement the reform plan of vocational education according to local conditions and make mistakes. The “double-qualified” teacher team’s collaborative education is the key choice to implement this fundamental task. This paper uses the TF-IDF algorithm and the LDA topic classification model to conduct quantitative analysis, sorts out the internal mechanism of collaborative education, analyzes the basic situation of the double -qualified teacher team, and explores the coupling of curriculum setting and professional talent training to educate people for higher vocational colleges. Provide a new paradigm.

Keywords: Symbiosis Theory · F-IDF Algorithm · LDA Topic Classification Model · Collaborative Education · Mechanism Coupling

1 Introduction

In recent years, the “Opinions of the Central Committee of the Communist Party of China and the State Council on Comprehensively Deepening the Reform of Teacher Team Construction in the New Era” and the “National Vocational Education Reform Implementation Plan” have both put forward new requirements and tasks for the reform of teacher team construction. “Double-qualified” teachers are one of the important construction tasks. Specifically, by 2022, “double-qualified” teachers in vocational colleges will account for more than half of the teachers in professional courses, and 100 “double-qualified” teachers will be built for school-enterprise cooperation. “Teacher training base and 100 national-level enterprise practice bases. There are 33 higher vocational colleges and 19 secondary vocational colleges in Hunan Province, which can provide only about 15,000 logistics talents with advanced technical skills. The annual training scale of higher vocational logistics talents in Hunan Province is about 8,000, and the annual training scale of on-the-job personnel is about 50,000. The quantity and specifications of Hunan logistics skilled personnel can not meet the current logistics market demand (Fig. 1).

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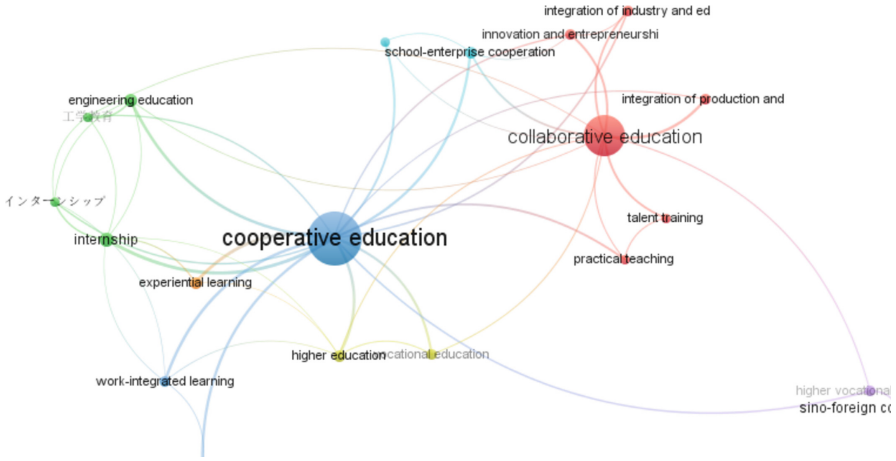


Fig. 1. Research trend of collaborative education

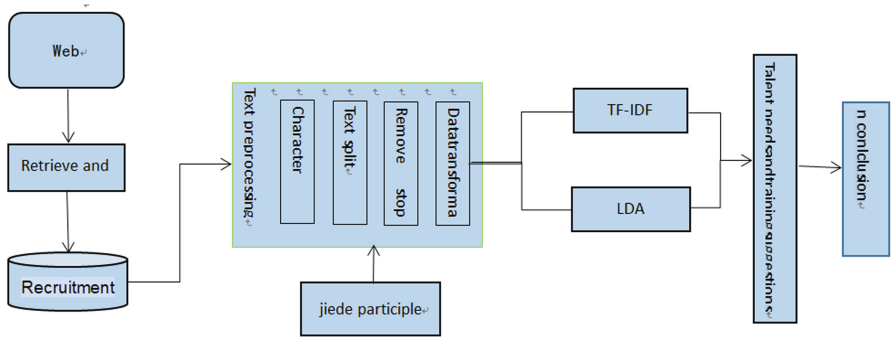


Fig. 2. Analysis process of the construction of a double-qualified team for logistics majors

2 Data Sources and Processing Methods

2.1 Data Sources

This paper takes higher vocational logistics schools as the data crawling object, focuses on Hunan Modern Logistics Vocational and Technical College, Tianjin Transportation Vocational and Technical College, Liaoning Economic Vocational and Technical College to collect website data, and sorts out the sources of employment data for these four logistics majors. Using the two system data of crawling software, using the method of text mining to analyze the needs of enterprises, and extracting skills and ability requirements through the TF-IDF word frequency and LDA model, the analysis diagram is as shown in Fig. 2.

2.2 Research Methods

First, the keywords of the text are extracted using the TF-IDF algorithm in python’s jieba word segmentation third-party library. By comparing this algorithm, it is a more practical method. Through word frequency statistics, we can find the abilities and skills required by the double -qualified teachers. Secondly, the LDA topic model is applied to classify by the topic of skill demand, which realizes the clustering of phrases by using the co-occurrence frequency of words. Finally, the statistics of the core courses of logistics major in Hunan higher vocational colleges are carried out, and the data of industry demand is compared and analyzed, and suggestions are put forward from the aspects of integration of production and education, apprenticeship, and talent training mode.

3 Analysis of the Needs of Double-Qualified Teachers

3.1 Basic Situation of the Demand for Double-Qualified Teachers

In 2020, there will be 1,205,100 full-time teachers in vocational colleges (excluding technical schools), 649,100 full-time teachers in secondary vocational schools, and 556,000 full-time teachers in higher vocational schools. The total number of “double-qualified” teachers is 422,500, accounting for 54.50% of the teachers of professional courses in vocational colleges. The proportion of “double-qualified “ teachers in vocational professional courses (excluding technical schools) is 54.85%, and the proportion of “double-qualified” teachers in vocational professional courses is 54.20%. (full caliber accounts for 35%) (Fig. 3).

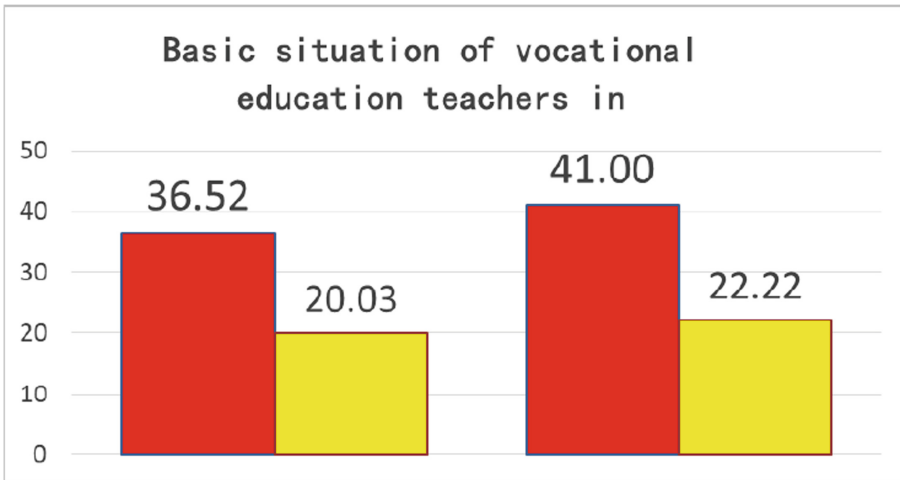


Fig. 3. Proportion of “double-qualified” teachers in vocational colleges

3.2 Analysis of the Skill Demand of Double-Qualified Teachers

The logistics industry is divided into basic skills and skills required by the manufacturing industry. By sorting out the keywords of skilled talents in the industry, and through TF-IDF word frequency analysis and calculation, it is concluded that warehousing, distribution, maintenance, receiving, inventory, sorting, processing, Documents, orders, and management words are the most frequently used.

In order to accurately determine the school’s demand for logistics dual-qualified teachers, the author further analyzed the collected job data. The LDA model is used to sort out and analyze the job keywords, and the results are sorted and analyzed, and the LDA model is constructed according to the results, as shown in Table 1.

Through sorting out, it is found that the intensity of theme 1 is high, indicating manufacturing logistics skills such as documents, freight, warehousing, overall planning, agency, customs declaration, shipping, communication, etc.; theme 2 represents basic skills, such as forklift, maintenance, distribution, receiving, Inventory, sorting, handling, processing, documents, etc. The theme 2 is the basic skills of logistics. as shown in picture 2 (Fig. 4).

Table 1. Ranks in descending order of relevance of manufacturing-related skill words

serial number	name	(Top 10) terms associated with the subject									
		document	freight	Warehousing	Overall planning	acting	customs clearance	overseas	communicate	Operation	document
Topic 1	Manufacturing Logistics Skills	document	freight	Warehousing	Overall planning	acting	customs clearance	overseas	communicate	Operation	document
Topic 2	Logistics basic skills	forklift	delivery	conservation	Receipt	inventory	sorting	processing	documents	carry	manage

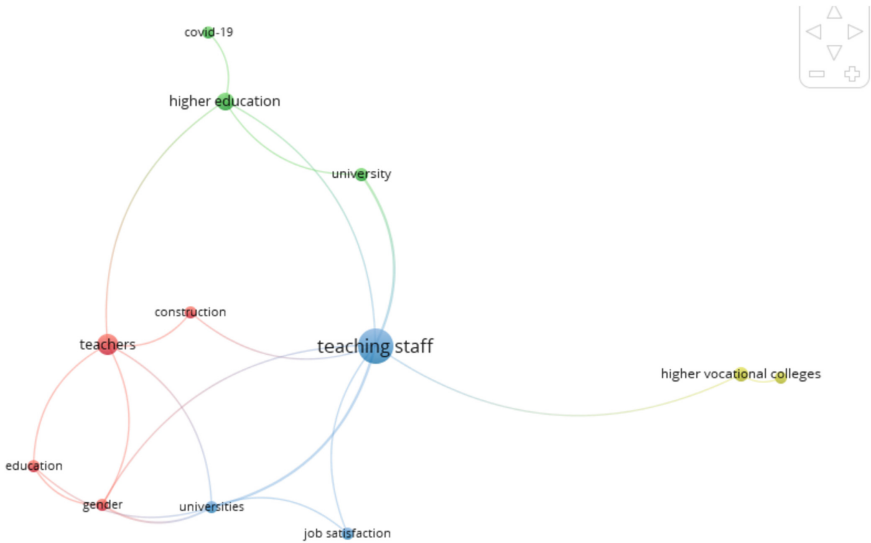


Fig. 4. Higher Vocational Dual-qualified Research Model

4 The Theoretical Basis for Promoting the Collaborative Education of “Double-Qualified” Teachers in the Logistics Specialty of Higher Vocational Colleges

4.1 Coupling of Educational Standards

When reviewing the collaborative education of relevant local colleges and universities, we will find that for different majors and different industries, there will be deviations in the coordination mechanism. There is a vague theory on the standard of “double-qualified” teachers’ mastery of practical teaching ability and knowledge update degree. There are different measurement standards in the subject system, which leads to the emergence of the phenomenon of “double-qualification” in certificate theory and achievement theory. (Deng et al., 2019) [1] The “National Vocational Education Reform Implementation Plan” clearly defines the standard of “dual teacher type”, which means that teachers who have both theoretical teaching and practical teaching ability should abandon the traditional single teaching model and establish a collaborative, shared and integrated education system. Human thinking, in terms of professional knowledge structure, enhance the ability to practice and promote the “double-trained” collaborative education paradigm of multi-subject participation, multi-technology application, and multi-level collaboration. It is necessary to make full use of information technology and the Internet to create The new way of Internet + classroom, so as to promote the collaborative sharing of educational resources.

4.2 The Coupling of the Education Evaluation System

At present, there are generally no evaluation institutions in colleges and universities in the central region, and the evaluation system of vocational colleges is more imperfect. As far as our school is concerned, the “dual-qualification” evaluation system has a low level of awareness in terms of standards, construction, goals, training, and evaluation. Clearly, there are also ambiguities in the practice class hours of teachers’ posts and “double-qualified” practice companies, and the performance appraisal of teachers is not fully linked to wages. Teachers’ enthusiasm for the dual-teacher type remains in research rather than practice. As a brand-new new model of educating people, the “dual-teacher type” collaborative symbiosis is not only a brand-new attempt for enterprises, but also of great significance for schools. The mutual benefit of talents is symbiotic, and its ultimate purpose is to cultivate qualified skilled talents for the society, which is a goal orientation of education returning to the essence of educating people (Dong and Ding, 2018) [2].

4.3 The Coupling of the Education Team

Since its development, higher vocational colleges have their own characteristics and highlights in terms of “dual-professional” team building and school-enterprise cooperation and development. In terms of practice, fixed-post internships are mainly carried out, and there are phenomena such as “isolated islands of double teachers” and “difficulty in school and enterprise”, resulting in weak coordination, lack of deep cooperation, and lack of motivation (China Vocational and Technical Education, 2018) (Li 2020) [3]. On

the basis of school-enterprise cooperation, the creation of a “dual-professional” benefit symbiosis synergy mechanism has subverted the previous model. It is to focus on building a shared team on the basis of clarifying the sharing of resources for educating people and building on the basis of educating people. Resource. Starting from the values of both parties, through the common values, we can revitalize the education resources, build an education team, effectively connect the practical education courses, and integrate the “double-qualified” team into the whole process of educating people. Enterprise cooperation mechanism to build a new paradigm.

5 From the Perspective of Symbiosis Theory

Vocational logistics talents have become one of the talents urgently needed in the current industry. There are about 1,288 logistics majors, as shown in Table 2, and the number of people trained is 242,900. According to the current industry demand, there is still a gap of about 300,000 (China Vocational and Technical Education, 2019) (Li and Yu 2021) [4]. From the perspective of symbiotic theory, the symbiotic unit, symbiotic model and symbiotic environment are the specific carriers.

5.1 Teachers Communicate with Each Other

On the basis of the in-depth cooperation of the vocational education group, the two parties share human resources. On the one hand, the company will use skilled craftsmen. After work, they can also go to the school to participate in theoretical study and guide the development of talent training programs and school-enterprise cooperation teaching materials; teachers use them during winter and summer vacations. Internship opportunities in the company to participate in practical training, the two sides formed a virtuous circle in terms of teachers. On the other hand, the school practice base makes full use of the advantages of the group platform to jointly build and share the training base. The school provides intellectual support and talent support for its construction planning, and the enterprise provides practice for school students in curriculum practice, professional training, and post-graduation practice. Training opportunities, and participate in

Table 2. The training of logistics professionals in vocational colleges in my country in 2020

type	Professional Points (pcs)	Enrollment (10,000 people)	Number of graduates (10,000 people)	Number of students in school (10,000 people)
Higher vocational	1288	8.82	8.05	24.29
secondary vocational	560	2.86	2.71	8.30

Data source: China Federation of Logistics and Purchasing, National Logistics Vocational Education Teaching Steering Committee

the production and operation of the enterprise during the internship process, accept the influence of corporate culture, and cultivate echelon talents for the enterprise. In the process of enterprise practice, teachers can participate in the research and development of some practical problems in the production and operation process of the enterprise, and apply for patents and other inventions. At the same time, this issue can also be used as the content of teaching, research and teaching reform to declare relevant horizontal and vertical topics. In the process of symbiosis and co-growth, mutual promotion and mutual teaching can effectively promote the collaborative teaching of “double-qualified” teachers.

5.2 Curriculum Integration

The author sorts out the curriculum setting through statistics, and categorizes the frequency of words. In the basic courses, logistics management is the most frequent, a total of 10 times. Warehouse management, transportation practice, distribution practice, etc. are the main courses; international logistics courses appear most frequently. It is customs declaration and inspection, a total of 7 times; college mathematics, logistics English, management, etc. are the main courses in public compulsory courses; in the comprehensive ability and literacy training course, etiquette practice, business etiquette,

Table 3. Curriculum setting

frequency	public basic courses	frequency	Basic courses in logistics	frequency	International trade courses	frequency	Comprehensive ability and quality training courses
4	college math	10	Logistics management	7	Declaration	1	Etiquette Practice
2	Logistics English	6	warehouse management	6	international trade	1	Business etiquette
2	management	4	transportation practice	3	Customs declaration practice	1	Marketing Negotiation
2	Principles of Marxism	3	Delivery practice	3	International Logistics Management	1	Practical Writing
2	Practical English	3	Procurement and Supply Practices	2	trade english	1	foreign etiquette
2	Marketing Practice	3	Logistics facilities and equipment	2	International freight forwarder		
2	E-Commerce Management	3	production operation	2	Typical case of foreign trade		
1	Western Economics	3	Production enterprise logistics	1	computer application		
1	University Chinese	3	Logistics costs	1	Billing Practice		
1	Statistical Practice	3	Logistics computer should have	1	English speaking practice		

Co-development curriculum system diagram

marketing negotiation, foreign-related etiquette and applied writing appeared once, see Table 3 for details.

5.3 Mutual Promotion of Techniques

Vocational education not only pays attention to theoretical education, but also pays more attention to the teaching of practical skills. The relevant documents clearly require that practical education should account for more than half of theoretical education in principle. The emphasis is on skills (Mei 2021) [5]. On the basis of the symbiosis unit and symbiosis model, make full use of the enterprise cloud platform and training factory to provide more choices for teaching methods., On the other hand, while protecting the core interests of the enterprise, make full use of the school-enterprise training base. In this link, it is necessary to make it clear that the students play the role of “quasi-employees”, and they must carry out training operations in strict accordance with the requirements of the enterprise, and the skills include professional ethics. Literacy, professional quality and job requirements, creating practical training for students is work, and the classroom is the real work environment, improving their skills and abilities (Zhang 2019) [6].

6 Conclusion

The author uses TF-IDF, LDA and other methods to analyze the related skills keywords in the logistics industry. The data source has certain limitations. The single data source is not enough for the universality of the analysis results. It is necessary to further expand the data source. Diversity of channels and data samples, it is necessary to increase the collection and sorting of data from authoritative websites such as 51.com, Talent Network, Zhilian, etc., so as to obtain more data samples from channels to demonstrate the research results. From the perspective of development, The teaching system and the development of the industry are not enough as the research objects. Nowadays, the logistics teaching is also affected by the policy, region, economy, political environment, etc. (Zhu et al.,2021) [7]. It is necessary to further improve the understanding of the problem and view the logistics double -qualified teachers from a multi-angle system.

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