

# *A Bibliometric Analysis and Exploration of the Current Development of Industry—Education Integration Research in Vocational Education*

**Yuan Hu**

*Chongqing Vocational College of Science and Technology, Dazu, Chongqing, 402360, China*

**Keywords:** Vocational education; integration of industry and education; econometric analysis; current development

**Abstract:** The integration of industry and education is the concrete embodiment of the "original heart and mission" of vocational education institutions in the new era, the effective action of a series of educational policies such as accelerating the reform of modern vocational education and fostering "craftsmanship", and the way for vocational education in the post-expansion era. "It is also a necessary path for the high-quality development of vocational education in the post-enrollment expansion era. This paper collects the literature on the integration of vocational education industry and education, and conducts an in-depth analysis of the integration of vocational education industry and education, in order to better understand the current situation and development of the integration of vocational education industry and education.

## **1. Introduction**

Since 2013, the research literature on the integration of industry and education has achieved a jump in both quantity and quality, especially in 2017 and 2018, with a 100% growth. Industry-education integration has become one of the focal points of education research concerns in the new era. Therefore, it is very important to sort out the research literature on the integration of industry and education, analyze, refine and summarize the relevant achievements, characteristics and trends for the practice, long-term mechanism construction and theoretical research on the integration of industry and education.

This research mainly uses CiteSpace software to collect and organize the research literature on the integration of industry and education, and through screening and summarizing the research literature on the integration of industry and education and conducting in-depth analysis, so as to understand the current situation and development strategies of the integration of industry and education in China's higher education institutions.

## **2. The current situation of the integration of industry and education in higher vocational colleges in China.**

### **2.1 The team of dual-teacher quality teachers is gradually growing.**

In school-enterprise cooperation, schools and enterprises have made concerted efforts to actively explore the construction of "double-teacher" teachers, and gradually strengthened the "double-teacher" teacher team by carrying out the school-level "double-teacher" teacher identification assessment, enabling teachers to go deep into the front line of production to promote their professional development, and injecting school-enterprise strength into the construction of teachers.

### **2.2 The training goals of both schools and enterprises are not unified.**

Enterprises pay attention to economic benefits, while schools pay attention to social benefits<sup>[1]</sup>. The fundamental goal of the enterprise is to obtain market benefits, and the cost and income are the decisive variables that affect the participation of enterprises in vocational education. The fundamental goal of the school is to cultivate technical and skilled talents suitable for the needs of industrial transformation and upgrading and economic and social development, so as to obtain social benefits with talent dividends. The difference between schools and enterprises in terms of talent training goals leads to an opportunistic tendency from the perspective of maximizing their own interests in the process of integrating industry and education. Specifically, enterprises often pursue the economic benefits of production, and the vocational and technical talents cultivated by the integration of industry and education belong to public talents with non-exclusivity characteristics. Therefore, enterprises may not be able to "incorporate the talents they participate in the training to a large extent in the future", which has hits on enterprises' participation in the integration of industry and education. Intivation. Schools pursue more employment rate, so they will pay more attention to students' future career adaptability in talent targeting, and consciously enable students to acquire their core competitiveness in different enterprises. This difference between the pursuit of "interests" and the goal of talent training leads schools and enterprises to do their own ways in talent training and cannot form a development synergy. Differences in objectives between subjects can easily lead to the failure of transactions or the instability of cooperative relationships, increasing the cooperation and transaction costs between schools and enterprises<sup>[2]</sup>.

### **2.3 The system and mechanism of the integration of industry and education are not perfect.**

In terms of institutions, Fang Yiquan and others believe that although there are a large number of normative documents for the integration of industry and education in China, they show a process of "self-replication and self-sustainment" that lacks institutional innovation. Zeng Yang pointed out that the institutional environment for the integration of vocational education in China has problems such as insufficient motivation for the participation of enterprises, insufficient counterpart of professional settings, and insufficient effectiveness of school-enterprise cooperation.

Through a statistical analysis of the opinions on the implementation of the national integration of industry and education and the opinions on the integration of industry and education in 22 provinces, it can be seen that there are 17 provinces with an overall docking of more than 80% (21/26), accounting for 77% of the total statistics. It shows that when introducing the integration programs of industry and education in the region, the provinces have given more consideration to the national policy orientation and development priorities, using the national program as the guide for action.

From the perspective of overall innovation, the highest innovation is the Ningxia Hui

Autonomous Region, which has reached 38.5% (10/26); Tianjin, Inner Mongolia Autonomous Region, Sichuan, Yunnan, Shaanxi and Qinghai provinces have not innovated; the remaining provinces have more or less innovated according to the regional development plan and industrial characteristics. The innovation balance is about 11.5% (3/26). From this, it can be seen that some provinces have also taken into account the characteristics and actual needs of local industrial development on the basis of ensuring that the overall direction is connected with the state. They take the integration of industry and education as an important opportunity to cultivate talents to support the development of local characteristic industries, and make overall plans with policy texts. Generally speaking, the provinces are in line with the national program planning in terms of integration of industry and education, and only a few provinces have made practical innovations, which has to some extent caused the closure and rigidity of the industrial and education integration system environment, which is not conducive to the cultivation of talents according to local conditions<sup>[3]</sup>.

## **2.4 The cultivation mode of "Double-qualified teacher" is unclear.**

"Double-qualified teacher" education is an inherent requirement for the integration of industry and education and school-enterprise cooperation in vocational education. Only when both schools and enterprises truly assume the main responsibility in the process of industry-education integration can the talent training process develop in the direction of rational integration. However, in the process of specifically promoting the "double subject" education model, the school and enterprises do not have a good understanding of the "double subject". Fundamentally, this is mainly due to the inadequate claim of the main identity of both schools and enterprises. Schools and enterprises are both subjects of vocational education and education, but there has always been a problem of blurring boundaries between their respective "masters" and how to balance and cooperate between the two sides. It is generally believed that schools should "master" the theoretical knowledge of students and the practical skills of enterprise "main" students, but in reality, schools also need to deepen students' understanding of theory through practical activities, and enterprises also need to carry out certain theoretical explanations to carry out more scientific operational demonstration. It can be seen that theory and practice do not have obvious boundaries and are not completely divided, but are interrelated and influenced. The ambiguity of the boundaries of this theoretical knowledge and practical skills in the process of training makes it impossible for schools and enterprises to form identity in the process of "double-subject" education, so the teaching tasks they need to undertake are not clear enough. Zheng Yongjin and others found that most enterprises do not recognize "student position adaptability" very high.

## **3. The development strategy of the integration of industry and education in higher vocational colleges in China.**

### **3.1 The education concept of school-enterprise culture integration**

First of all, innovate the "class-enterprise" dual environment to educate people. Transform the classroom according to the working environment of the enterprise, and at the same time, the training base and some positions in the enterprise will be pedagogical according to the school learning environment, create an enterprise working atmosphere in the school, and create a school atmosphere in the enterprise, so that students can be better exercised in this "work and learning" environmental atmosphere.

Secondly, carry out "study-professional" double tutor education. The school hires professional tutors from enterprises to carry out work with counselors, integrates school motto and craftsmanship

spirit to carry out experiential teaching of professional literacy, and cultivate students' values of patriotism, school, enterprise and post. Enterprise teachers in the school need to be assigned to each class and the counselor to jointly manage the class, among which the counselor is responsible for the education of the school motto, patriotism, craftsmanship and the core values of socialism, while the enterprise tutor is responsible for giving students professional cutting-edge science popularization lectures, introducing major, position, career planning and professional direction. Guide and be responsible for bringing students to skills competitions, innovation and entrepreneurship competitions and providing technical services.

Finally, implement the dual role of "student-employee" to educate people. That is, by implementing class enterprise management, students can familiarize themselves with the enterprise management process and improve their professional quality. Schools can jointly establish industrial colleges with enterprises, transform each class into different subsidiaries, and implement class enterprise management. The enterprise KPI assessment system can be used to rebuild students' virtual salary evaluation system, evaluate students' performance in the first and second classes, and calculate the average virtual salary of the class every month. In this way, you can not only test the effect of enterprise management, but also use virtual salary to evaluate student scholarships and honorary titles<sup>[4]</sup>.

### **3.2 Teacher teams of mixed schools and enterprises**

The construction of teachers is an important link in the process of integrating industry and education, and it is also an important guarantee to improve the quality of talent training. The practical operation ability of school teachers is weaker than that of enterprise teachers, but business teachers usually lack the belief of morality and cultivation, and teaching skills and methods need to be improved. This requires a scientific and reasonable balance between the positions, responsibilities and tasks of school teachers and enterprise teachers in the process of teacher construction, mix and integrate the teacher team with the principle of mutual training, implement integrated management, and finally promote and improve each other in complementarity.

Among them, "mutual training" is a process of purposefully improving the level of teachers through training, which can provide a perfect growth environment for the growth of teachers, and finally cultivate enterprise teachers who understand education and teaching and school teachers who understand practical operation. "Mutual" is to let school teachers or enterprise teachers with outstanding ability The party unit works part-time, improves the structure of the teacher team, and realizes the state of integration and balance of junior college; "mutual employment" can meet the educational guidance and salary and salary demands of school teachers and enterprise teachers with an "official identity" mechanism, mobilize the enthusiasm of school teachers and enterprise teachers to learn and teach, and further promote Blood update and turnover of vocational education teachers.

Generally speaking, through mutual training, allowing enterprise teachers to participate in the school's party building, teaching, scientific research and service activities, and allowing school teachers to participate in enterprise production, management and technical transformation, we can improve the level of vocational education teachers, and finally realize mutual recruitment in the construction of teachers, and fundamentally build "understand production and teaching". A mixed team of teachers.

### **3.3 Integrate the content of school-enterprise cooperation**

Build a community of school-enterprise destiny with the industrial college as the carrier, innovate and practice the six common long-term mechanisms of "investment, enrollment, teaching, management, employment and service", and solve the problems of inactive enterprise participation

in the process of school-enterprise cooperation, and the difficulty of integrating teaching content, practical training conditions, management methods and vocational position capabilities.

First, benefit from joint investment to ensure the unification of the school's responsibilities. The fundamental way to solve the unification of responsibilities and rights in school-enterprise cooperation is to promote the joint investment of both schools and enterprises in talent training and resource construction, because only by real efforts can we promote the true integration of industry and education with income. Schools and enterprises can jointly invest in the construction of industrial colleges, and reach a consensus and work together in the investment of software and hardware resources such as construction land, environmental construction, instruments and equipment, teaching resource banks, service teams, employment resources, industry resources, and enterprise management experience, so that both schools and enterprises can achieve joint investment and sharing. Insurance, shared income.

Second, jointly teach and scientific research to ensure the quality of talent training. Vocational college teachers generally enter the school to work after receiving normal education, so they are weaker than the operation of the workplace, and the division of work positions in the enterprise is clear. The skills that enterprise teachers are good at may be a project or situation in a certain course of the school. Therefore, in the process of integrating industry and education, it is necessary to promote communication and flow between school teachers and enterprise teachers. Through joint teaching and joint scientific research, teachers can be effectively allocated and complemented, so as to better promote the improvement of students' vocational skills and comprehensive literacy.

Third, jointly promote employment and ensure the benefits of school-enterprise cooperation. Talent quality is a "knocking brick" for talent employment and a touchstone to test the depth of school-enterprise cooperation. Schools carry out talent training as "entrances", and enterprises employ talents as "exports". The joint promotion of employment between schools and enterprises can fundamentally ensure the smoothness of talent employment channels. Enterprises are no longer picky choices, but guides and leaders in talent employment.

Fourth, participate in the construction together to ensure the national strategy of service. Any school or enterprise is a small element in society, and its development and progress will eventually be included in the evaluation parameters of social development. The ultimate goal of the integration of industry and education is to serve the implementation of national strategies such as rural revitalization, the Belt and Road Initiative, and the Chengdu-Chongqing Shuangcheng Economic Circle with high-quality technical and skilled talents, which is the ultimate mission of school-enterprise cooperation. Only when schools and enterprises always take serving social construction and national strategies as their development goals can they truly gain inexhaustible development momentum.

### **3.4 Promote the in-depth reform of the education model of higher vocational colleges.**

The National Opinions on Promoting the High-quality Development of Modern Vocational Education clearly requires further promoting the reform of the way of education in vocational colleges and universities and enhancing the adaptability of vocational education. As an important factor to stimulate the vitality of vocational colleges, the in-depth development of the integration of industry and education will inevitably lead to the profound changes of the education model of higher vocational colleges, promote the reform and innovation of teaching methods, and improve the accuracy, practice and flexibility of education in higher vocational colleges.

First, integrate school talent training and enterprise production process, and improve the accuracy of talent training. The Measures for the Management of Industry-University Cooperation and Education Project of the Ministry of Education points out the practical direction of promoting

the reform of talent training in colleges and universities with the latest needs of industrial and technological development. With the comprehensive docking of educational elements of higher vocational colleges and the production factors of enterprises, the training of talents in higher vocational colleges will change from the current "relatively closed" and "self-circulation". In order to "more open" and "school-enterprise linkage", we accurately connect industry standards in the process of educating people, integrate the knowledge and skills of enterprise production and R&D, the chain of scientific and technological progress in related professional fields, and the latest trends of industry development, so that the training of school talents is more in line with practical needs.

Second, strengthen the cutting-edge skills training of industry production practice and enhance the practicality of education and teaching. The National Guiding Opinions on Comprehensively Promoting the New Apprenticeship System for Enterprises with Chinese Characteristics and Strengthening the Training of Skilled Talents requires the integration of industry and education as a means to promote the talent training process to be more demand-oriented and effectively improve students' vocational skills. The teaching reform of higher vocational colleges and universities under the integration of industry and education will promote the full implementation of school education and teaching to introduce "production" into "teaching". The teaching content will change from the traditional "concept" and "view" as the core to focus on "skills" and "practice". The teaching process will change from "learning to use" to "use to learn". Learning will be guided by solving practical problems in production practice, focusing on practical knowledge teaching and skills training, and forming a teaching model with practice and application as the core.

Third, break the time and space constraints of school education and improve the flexibility of school education. In terms of time, through the introduction of all elements of enterprise production, the talent training process of higher vocational colleges will change the traditional training model and realize the short-term alternation of school theoretical teaching and enterprise internship practice. In terms of space, the teaching activities of higher vocational colleges will not be limited to the scope of the school, and the school and even the whole society will become educational work. The moving place has greatly expanded the education space of the school.

### **3.5 Drive the transformation and upgrading of the enterprise employment model in the industry.**

Continuously promoting the transformation and upgrading of industrial structure is a major strategy in China, and whether we can build a talent team that meets the needs of industrial structure transformation and upgrading is the key factor determining the success or failure of the reform. In the process of deeply participating in the integration of industry and education, industry enterprises can effectively promote the transformation and upgrading of the employment model and promote it to form a more active, direct and open employment model. First, promote the enterprise employment model from the "downstream" of the talent chain to the "upstream" to effectively save employment costs. Most Chinese enterprises are a "streamline" employment model from the "upstream" of the school to the "downstream" of the enterprise. Industry enterprises "passively" choose and hire talents cultivated from the "upstream" of the school, so that enterprises have only lower employment accuracy under high employment costs. With the deepening of the integration of industry and education, especially the promulgation of a series of national policies and measures to encourage and support industry enterprises to participate in the development of vocational education, it will promote industry enterprises to participate more directly in the "upstream" talent training of schools, put enterprise training ahead, save labor costs to the maximum extent, and accelerate the speed of talent incubation. Second, promote the change of enterprise employment from "school recruitment" to "intensive training", and it will become the norm for enterprises to run

universities. The in-depth integration of industry and education, as well as the expansion of the scale of enterprise employment and the accumulation of talent training experience, especially the promulgation of the national "Implementation Measures for Building an Integrated Industry-education Enterprise (Trial)" and the "Guidelines for the Construction of Modern Industrial Colleges (Trial)" have further stimulated industry enterprises to directly participate in the talent training process. The internal kinetic energy. Some large enterprises directly cultivate the required professionals and improve the accuracy of educating and employing people through "enterprise universities" and jointly organizing modern industrial colleges with higher vocational colleges. Third, drive the employment object of enterprises from "localization" to "internationalization" and promote the international development of enterprises. With the full implementation of strategies such as the Belt and Road Initiative and enterprise "going global", China's enterprise development is also facing an irreversible new situation of internationalization and globalization. The new situation requires new experience, new technologies and new talents. Some large enterprises will certainly cultivate and recruit more internationalization with the improvement of the degree of internationalization. Talents with vision and ability provide strong intellectual and human support for the international development of enterprises.

### **3.6 Promote the reform and innovation of the integrated development model of industry and education.**

After 2017, on the basis of making systematic institutional arrangements for deepening the integration of industry and education and school-enterprise cooperation, the state is focusing on building a sustainable industry-education integration model. In the face of outstanding problems such as insufficient initiative and wide coverage of the integration of industry and education in higher vocational education in China, further promoting the reform and innovation of the development model of industry-education integration can promote the integration of industry and education in higher vocational education to be more active, comprehensive and in-depth, and form a new pattern of industry-education integration with all elements of industry and education. First, change from "passive integration" to "active integration" to enhance the kinetic energy of the integration of industry and education. With the continuous deepening of the integration of industry and education, the initiative of school education and industry enterprises to participate in the integration of industry and education is also increasing. Gradually, from the unilateral exploration of early schools and the guidance of national policies, it developed into an "active integration" around the common interests of both sides. The enhancement of the initiative of industry-education integration will also encourage schools and enterprises to form a more stable community of interests and cooperate to promote the benign development of industry-education integration. Second, change from "hardware fusion" to "software fusion", enriching the connotation of industry and education integration. For a long time, the integration of industry and education has been limited to the category of "hardware integration", such as enriching school resources with the help of enterprises and establishing internship training bases. With the deepening of integration, industry and education pay more attention to "software integration" and strengthen and promote the in-depth integration of schools and enterprises in the construction of disciplines and majors, curriculum teaching reform, and the construction of teachers. Third, change from "entity integration" to "virtual integration" to expand the space for the integration of industry and education. In recent years, the highly developed network information technology has triggered great changes in the field of education. In particular, virtual reality technology has brought new opportunities for the integrated and innovative development of higher vocational education. With the help of this advanced technology, it is possible for the future integration of industry and education to break through the

limitations of time, region and even country, integrate various resources of schools and enterprises through "Internet +" and virtual reality technology, realize the widest, scientific and optimal allocation of resources, and promote the full play of the efficiency of industrial and education integration<sup>[5]</sup>.

#### 4. Conclusions

To sum up, under the new situation of enhancing the adaptability and attractiveness of vocational education and promoting the high-quality development of vocational education, it is necessary to further strengthen the determination to adhere to the integration of industry and education and school-enterprise cooperation, and continue to open up innovation in policy supply, condition guarantee, practical innovation and other aspects. In order to integrate industry and education and the road of school-enterprise cooperation becoming wider and wider, it is necessary to adhere to policy evolution and practical innovation, so that the government's overall planning and market-driven two-way promotion and the implementation of enterprises and schools have become the norm.

#### References

- [1] Fengyue L, Liwan W&Tingting G. (2022). *Bibliometric Analysis and Integration of Industry and Education in Vocational Education*. *Journal of Hebei Normal University: Education Science edition*.
- [2] Jiafu C, Qing L, Yaqian Z, et al. (2021). *Review of the Research on the Integration of Industry and Education in Higher Vocational Colleges: A Literature Measurement Analysis Based on Knowledge Map*. *Life education*.
- [3] Lifeng C, Zhiping X, Zhongyue L. (2022). *Research on the current situation and path of the integration of industry and education in vocational colleges and universities from the perspective of stakeholders: a questionnaire based on some vocational colleges and universities in Zhejiang Province*. *Vocational technology*.
- [4] Baojuan F. (2020). *The current situation and countermeasures of vocational education under the perspective of the integration of industry and education*. *Paper-making equipment and materials*.
- [5] Haoran Z. (2020). *Correlation analysis of the integrated development of industry and education in vocational education*.