

# *Exploration of the Basic Path for Cultivating Skilled Talents through Dual Education and Integration of Industry and Education*

Yanling Wu<sup>1,a,\*</sup>, Fangzhou Li<sup>1,b</sup>, Peina Zhang<sup>1,c</sup>, Liping Ma<sup>1,d</sup>

<sup>1</sup>School of Civil Engineering, Shandong Jiaotong University, Ji'nan 250357, China  
<sup>a</sup>wuyanling621@163.com, <sup>b</sup>lifangzhou0710@163.com, <sup>c</sup>zhangpeina1989@126.com,  
<sup>d</sup>3487023244@qq.com  
\*Corresponding author

**Keywords:** Integration of industry and education; teaching reform strategies

**Abstract:** This study comprehensively reviews and summarizes the theoretical achievements and practical experience of practical teaching research on practical dual education and industry education integration applied talents in domestic and foreign universities on the basis of literature research. By connecting with enterprises, the school designs and develops courses based on the actual needs of enterprises and students, and based on job requirements and abilities, reorganizes and optimizes the course system, thereby constructing a new course system that adapts to production reality. Meantime, effective teaching reform strategies should be formulated to enhance students' professional abilities and comprehensive literacy, and meet the requirements of social development.

## 1. Introduction

With the development of China's economy and society and the upgrading of industrial structure, the demand for high-quality skilled talents is increasing. It was first proposed to "improve the vocational education and training system, deepen the integration of industry and education, and promote school enterprise cooperation" mechanism in the report of the 19th national congress of the communist party of China in 2017. The General Office of the State Council issued the "Several Opinions on Deepening the Integration of Industry and Education" In December, further clarifying the policy connotation and institutional framework for deepening the integration of industry and education. This meeting emphasized the talent cultivation and reform plan of government coordination and enterprises as important entities. Its goal is to strive to build a "four in one" framework, extending the integration of industry and education from vocational education to the entire education system with a focus on vocational education and higher education, thereby promoting the implementation of industry and education integration from development concepts to institutional supply<sup>[1,2]</sup>. This measure can promote school enterprise collaboration and the integration of industry, academia, and research, deepen the education model of industry education integration, and achieve a win-win situation for schools and enterprises.

## 2. Current research status at home and abroad

At present, there is a lot of research on how to promote the cultivation of skilled talents, taking Shanxi Ordnance Industry Vocational and Technical College as an example. The school, together with BYD Auto Automobile Company, proposed four modules of "double collaboration, classified training, task driven, and curriculum certificate integration", committed to building a professional group of automobile, and forming a new talent training model of "after-school competition certificate" and "school enterprise cooperation". The understanding of 'job course certification competition' refers to setting up courses in conjunction with corresponding professional positions, while 'job' refers to accounting positions. "Curriculum" refers to the professional curriculum system of vocational schools<sup>[3]</sup>. "Competition" refers to the accounting professional skills competition. Certificate "refers to the vocational skill level certificate and vocational qualification certificate obtained from the enterprise's "1+X". The integration of "on-the-job course competition certificate" includes the integration of "on-the-job course", "course competition", and "course certificate". The addition of the "Post Course Competition Certificate" integration mode not only points out the direction of accounting professional curriculum reform, promotes the reform of the "three teaching" (teachers, textbooks, and teaching methods), clarifies the ideas for talent cultivation, but more importantly, strengthens the mechanism for school enterprise cooperation and operation, improves the integration and efficiency of school enterprise resources, and greatly improves the quality of talent cultivation<sup>[4]</sup>.

In addition, the Information Engineering Department of Shandong Vocational College of Science and Technology has signed order classes with Lenovo, Inspur, Huawei, and others, improving the new mechanism of school enterprise collaborative education. At present, there are similar research reports on industry education integration and school enterprise cooperation models abroad. This article takes Germany's "dual system" and the UK's "sandwich" model as examples to elaborate.

(1) The "dual system" was first proposed by Germany as a vocational education model<sup>[5]</sup>. It is mainly aimed at middle school graduates, with training as the main form. The entire training process is conducted in factories or enterprises, as well as vocational schools (BBS) established by the state. This model considers enterprises as a "single entity" and schools as a "dual entity" to participate in the entire education process. BBS is responsible for theoretical knowledge training, while factories or enterprises are responsible for practical operation training. This educational model can seamlessly connect school education with factory or enterprise production. The operational skills and hands-on abilities of students truly come from practice, rather than books, which truly avoids the phenomenon of "high scores but low abilities" among students.

(2) The "sandwich" model is a visual term for the "work study alternation" model of UK school enterprise integration and school enterprise cooperation<sup>[6]</sup>. It is a virtuous cycle training model of "theory practice theory", which conforms to the philosophical idea of "theory originates from practice and guides practice". Students adopt a "dual identity" management system, which combines the dual identities of students in school and employees in enterprises. Under this model, students can not only consolidate knowledge but also accumulate social experience. Its characteristics and effectiveness are as follows: the combination of theory and practice deepens students' understanding of their major and enhances their initiative and enthusiasm for learning.

(3) A collaborative education proposed by the School of Engineering at the University of Cincinnati in the United States<sup>[7]</sup>. Students who participate in cooperative education are more likely to find jobs and have higher job satisfaction after graduation. For enterprises, cooperative education can examine potential future employees, not only recruiting employees who are more suitable for the corporate culture and future development, but also reducing recruitment costs.

Chinese universities face the following main problems in serving local industries, including unreasonable professional settings and planning, insufficient construction of teaching staff, low utilization of training base equipment, and insufficient integration of industry, academia, and research. The reform of vocational education talent cultivation mode and curriculum reform interact and rely on each other. The integration of industry and education meets the requirements of the development of the times, and it has certain practical significance and theoretical value.

### **3. Research Value and Significance Research Value and Significance**

#### **3.1. Update Theoretical Knowledge**

At present, the education form led by schools can no longer fully meet the basic and expanding qualities of high-quality technical and skilled talents for economic and social development. Seeking external support and assistance, strengthening cooperation with industry enterprises, can achieve mutual benefit and win-win situation between schools and enterprises. This approach is the fundamental direction and practical trend for the development of future vocational education.

#### **3.2. Building the Teaching Staff**

Through school enterprise cooperation, not only has the practical operation ability of professional teachers been improved, but also a better platform has been provided for building a dual teacher team. In the context of the new economy, the strategy of strengthening school enterprise cooperation and deepening the integration of industry and education has provided important breakthroughs and development opportunities for further promoting the construction of the teaching staff in vocational colleges<sup>[8]</sup>.

#### **3.3. Promoting Student Employment**

In the past two years, affected by the scale of graduates and the downward pressure of the economy, the employment situation is relatively severe. Both schools and enterprises have established a "employment promotion" mechanism to educate graduates about employment situation, carry out career Career development, guide students to change their employment concepts, establish a correct concept of job selection, and improve employment satisfaction<sup>[9]</sup>. In addition, vocational colleges organized by state-owned enterprises should also consider three supporting elements: strengthening party building, integrating innovation systems, and continuously improving systems. Implementing the integration of industry and education in teaching reform can provide students with sufficient exercise, enhance their various abilities and comprehensive literacy, improve their career starting point, and have good career development prospects.

### **4. Improving the Path to Cultivating Skilled Talents**

Society needs innovation, and school education requires reform. The integration of innovation, industry and education is undoubtedly a measure to address practical needs, which can fully leverage the advantages of both schools and enterprises<sup>[10]</sup>. Based on the research and discussion of previous literature on dual education and integration of industry and education, we propose the teaching objectives and solutions to key issues of the dual education talent cultivation model from the perspectives of teaching models, teaching objectives, teacher teams, and government policies, as shown in Figure 1.

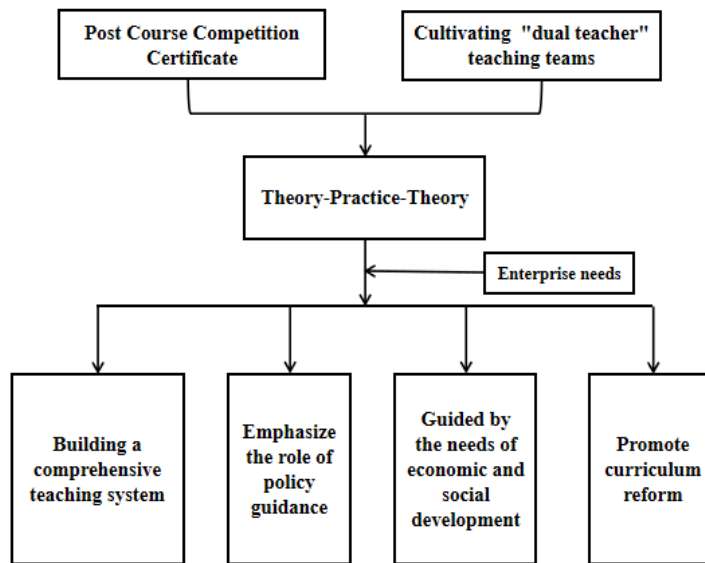


Figure 1 Main ways to implement the integration of industry and education.

#### 4.1. Analysis of the Application Elements of Integrating Dual Education and Practical Teaching for Applied Talents

Firstly, enterprises need to extract advanced technology from the industry and develop it into teaching resources. Using the school's teaching team as the teaching platform, develop a complete talent cultivation plan by integrating the school's experimental equipment. The prerequisite for the successful implementation of this content requires cooperation between enterprises and universities to achieve precision and win-win results in the implementation process.

#### 4.2. Promote Curriculum Reform

Actively guide vocational colleges to match the curriculum and majors with the needs of enterprises, establish dynamic talent cultivation plans, and better meet the needs of enterprises and society. Strengthening school enterprise cooperation, expanding the channels for enterprises to participate in the integration of industry and education, and strengthening the main role of enterprises in the integration of industry and education have a positive promoting effect on deepening the development of industry and education integration.

#### 4.3. Emphasize the Role of Policy Guidance

In the context of the new era, the importance of vocational education in China's talent cultivation system is constantly increasing, and the relevant policy system is also becoming increasingly standardized. Reasonable policy guidance can encourage and guide enterprises to participate more deeply in school enterprise cooperation platforms. The orientation of vocational colleges is to cultivate high-level technical and skilled talents who directly serve the development of industrial economy. Therefore, in the context of the integration of industry and education, talent cultivation in vocational colleges needs to break through the situation of unilateral government education. Actively guide vocational colleges to form a school enterprise cooperation and market-oriented vocational education model. This approach can promote the supply of high-level technical and

skilled talents, improve the construction of modern vocational education system, and improve the quality of education.

## 5. Conclusions

Vocational colleges should strengthen school enterprise cooperation and integration of industry and education, which requires enterprises to actively participate in school teaching activities and participate in the formulation of school curriculum and talent training plans according to employment standards. This approach can effectively solve the problem of talent demand in enterprises and achieve a win-win situation for both schools and enterprises. In the context of the integration of industry and education, the school enterprise cooperation model fully considers the demand for talent, and the development trend of future industries and employment. Based on practical professional courses and professional knowledge of enterprises, the integration of school education and enterprise training provides students with a good working environment and forms a good employment concept.

## Acknowledgment

Funding: This work is financially supported by the Education Science Research Project of China Transportation Education Research Association from 2022 to 2024 (JT2022YB307).

## References

- [1] Han B. *The teaching reform path of automotive majors in vocational schools under the integration of industry and education*[J]. *Era Automobile*, 2023, (12): 29-31.
- [2] Xiao R.H. *Reconstruction of the integration path of industry and education in applied universities from the perspective of government school enterprise collaboration*[J]. *Heilongjiang Researches on Higher Education*, 2023, 41(05): 143-148.
- [3] Ou P.L., Cai J.X. *Research on the path of the construction of practical training bases driven by the integration of industry and education and the cooperation between schools and enterprises*[J]. *Journal of Gansu Open University*, 2023, 33(01): 7-10.
- [4] Qi M.X., Yi L.Y. *Exploration on the construction and path of the cooperation mechanism between industry and education integration in local applied undergraduate colleges and enterprises*[J]. *Modern Commercial Industry*, 2022, 43(17): 70-72.
- [5] Liu Y.M., Mou X.L. *Analysis on the path of promoting local economic development through the integration of industry and education under the school enterprise cooperation model*[J]. *Modern Commercial Industry*, 2021, 42(32): 21-22.
- [6] Hong H.R. *The construction path of local university industry education integrated enterprise platform based on school enterprise cooperation*[J]. *Technology Economy Market*, 2021, (05): 124-125.
- [7] Li Y. *Research on the talent training path of "Integration of industry and education, school enterprise cooperation" in shenzhen technical colleges*[D]. *Guangdong Normal University of Technology*, 2020.
- [8] Hong J., Huang Y.Y. *Reflections on building a diversified development path for the integration of industry and education in vocational education: from the perspective of differentiation between industry and education integration and school enterprise cooperation*[J]. *Mechanical Vocational Education*, 2019, (06): 52-55.
- [9] Zhang C., Yang Q., Chen Y.K. *Exploration of the path for the integration of school enterprise cooperation, industry and education, and the reform of talent training models in higher vocational colleges*[J]. *Modern Communication*, 2019, (10): 35-36.
- [10] Zhang Y.Y. *Exploration and reflection on the training path of skilled talents under the background of industry education integration*[J]. *Research on Art Education*, 2015, (11): 108-109.