

Integration between Industry and Education: A Study of Localization of German Dual System in China

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Abstract: The German vocational system has around 100 years history and is regarded as role model by other countries. Chinese scientists and educators have also turned their attention to Germany. This study introduced the problems encountered during transfer of German vocational system in China, and found out the important characteristics of the success of the German system by explaining and comparing the differences between the Chinese and German systems. Localization is an optimal way of policy transfer. Regional chamber plays an important role in promoting vocational training.

1. Introduction

In 2010, China's Ministry of Education and Ministry of Finance issued a notice on the National Model Higher Vocational Institutions Construction Plan, proposing: "Deepen the reform of internal management and operation mechanism, and enhance the ability of higher vocational colleges and universities to serve regional economic and social development. Thus, industry and higher vocational colleges and universities can promote each other, and achieve the purpose of harmonious development of regional economy and society and higher vocational education", and the construction of the institutional mechanism for the integration of industry and education will be included in the central financial support project [1].

In the past 10 years, in China's vocational education, IBIE have improved comprehensively. IBIE has shown a diversified pattern. More than 1500 vocational education groups (alliances) have been established in China, covering more than 45,000 members including enterprises, schools, industries, and scientific research institutions. Under this model, each partner shares resources and responsibilities, and attempts to further deepen cooperation. 175 enterprises, which are among the world's top 500 enterprises, have participated in integrated vocational education. More than 3,000 enterprises, 21 cities have been piloted with the new model of IBIE [2].

So far, the process of Chinese vocational schools has achieved certain results. Schools have adopted different models of industry-education cooperation. Many of these schools have learned the dual vocational training model represented by Germany [3]. There is a significant gap between China and Germany in terms of basic national conditions and education systems. During the implementation of this model in Chinese institutions, new problems emerged. Combined with the existing problems, a student who graduated from the IBIE project and four trainers from the cooperative enterprises for this project were deeply interviewed, this project is in Jinan Vocational College. This study examined

the problems existing in the process of learning the German model in Chinese vocational colleges, and found possible scenarios for Chinese vocational system.

2. Traditional German vocational system

For a long time, the German vocational education model has owned various praise, like ‘a crown jewel in the German political economy’ [4]. This educational framework is also known as ‘German dual system’, is the combination of school-based learning with practical firm-based training (with primacy traditionally given to the latter). Vocational schools are responsible to provide theoretical foundations and some general courses, as complement to practical workplace training, such as mathematics and German. This mechanism compromised theoretical learning and work experience for many professions [5].

After three or three and a half years of dual training, students (and in this system, they are called ‘apprentices’) need to pass the examination and then obtain both the diploma of vocational school and the certificate of the Chambers of Industry and Commerce (The original German is *Industrie- und Handelskammer (IHK)*), and the regional Chamber has the right to organize the practical training examination. Apprentices can stay with the employer where they were trained, or they can also find employment elsewhere or continue their studies like entry in the high education. In such a system, the curriculum is developed by not only the teaching staff in addition to the school teachers and also trainers from the enterprise. In the past studies, research has shown that enterprises prefer to hire apprentices rather than graduates from two or three-year full-time courses from a vocational school [6].

3. Problems by transfer of German vocational System

The dual system is not only in Germany, but has also taken root and been developed in Austria, Denmark and Switzerland. And Chinese politicians and scientists have turned their attention towards Germany to improve the Chinese vocational education [3]. IBIE has since long been an important point in China's vocational education policy. In the documents issued by the education departments of the China's provinces, transformation or learning of the German dual system is mentioned many times. Some vocational colleges in China already have developed dual training programs, although the models are various. For example, Jinan Vocational College has set up a Sino-German institute, offered two majors (professions) mechatronics and metal cutting, and invited German enterprises to join the dual training. In the case of Dongguan Technician College, the college sets up Sino-German classes with six majors (professions), mechatronics, model design and manufacturing, numerical control machining, industrial design, automotive testing and maintenance, stomatology technology. So far, more and more vocational education schools are actively to develop professions in dual systems.

Not only China, in past studies, some countries, especially in Southern Europe, are trying to solve the integration problem by a similar concept of apprenticeship. This vocational system, one of the best solutions to the qualification problems, once transplanted to another country, may also work differently and imply different consequences for cultural and historical reasons. Characteristics of the German ‘training culture’ could be copied or transplanted or not, there remains substantial scepticism [6].

Jinan Vocational College has established the German dual system for 12 years. In this project, students study 4 weeks theoretical courses in college and 6 weeks of practical training in enterprises (mostly German enterprises). These enterprises are only a few in Jinan, such as FESTO. But there are many more companies, located hundreds of kilometres away, such as Marquardt in Weihai, Stihl in Qingdao, Mercedes-Benz in Beijing.

3.1 The school as the project organizer

In Germany, the to-be trained students should pass the recruiting interview at first, get offer from the enterprise and sign the training contract with the enterprise. And the enterprise finds a study place in the vocational school (*Berufsschule*) near the workplace for the to-be trained students. The enterprise pays the tuition fee for the students. That means, the to-be trained students are apprentices at first, then a student. In China, students are first enrolled as college students, and second go to be trained in the enterprises, which collaborated with the schools. In the Jinan case, because of the distance, there are a lot of transportation costs and security responsibility for the enterprises. This has reduced interest and engagement of the enterprise for IBIE.

3.2 Without national standard certificate

There is no certificate similar to that issued by the Chambers of Industry and Commerce in Germany, to prove the students' vocational and technical qualification. In the employment, such dual trained students cannot prove the work ability by the certificate, compared with full-time students, and did not have too many advantages in the recruiting.

3.3 Participation engagement of enterprises

Most of the participants in the dual-system training are large enterprises in this case, and the participation of small and medium-sized enterprises is low. An important role of apprenticeship is to solve the problem of human resources. Compared with the good reputation of large enterprises, the image advantage of small-sized enterprises in recruitment is not significant. In small enterprises, there is not much data to calculate the cost (such as pre-job training fees and recruitment costs) caused by employee engagement or training.

Not only in the Jinan Vocational College or Dongguan Technical College, also in other colleges, which have developed the dual system, most of the majors (professions) are concentrated in machinery manufacturing, industrial robots, automobiles, and the participating enterprises are naturally concentrated in traditional industrial occupations.

4. What can be learned from the German dual System?

The German training system, which originated in the 19th century, has survived the political and economic turmoil of the past 100 years because it has continuously and actively adapted to the challenges posed by the political and economic environment. Major characteristics of the German dual system are the key elements of its survival, which are worthy of reference for Chinese vocational colleges in the process of implementing dual-system.

4.1 Institutional responsibilities

In Germany, the dual system has been fully supported by all relevant stakeholders, such as business and labour, social democrats, and Christian democrats. The government directly participates in the training system, forced the enterprises to join the chambers and fulfil the membership responsibilities [7]. In order to enable apprentices trained by different enterprises to match the qualification standards of different enterprises, by ensuring a high degree of flexibility in the training of enterprises, nationally defined requirements have been developed, and the students must also pass the training examination. These measures make portable occupational a result of training [4].

4.2 legal basis

The German dual system is guaranteed by the law. Roles and responsibilities for various stakeholders have been set clearly [7]. In this way, the system remained combined with the past, and became the primary source of the quality control. This means that Germany's vocational training system, while not fully state controlled, certainly contains elements of regulation and compulsion. The Vocational Training Act, enacted in 1969, is considered an important tool for integrating quality control into the training system. The law also helped the increasing the participation of small and medium-sized enterprises. The 2005 law encourages and promotes the contact and cooperation between enterprises, those large companies with training base and financial strength, develop 'models', and sell them to smaller companies, which don't have ability to give a workplace-based training, or capability to develop a certain curriculum. These changes benefit from the development of ICT apprenticeship models, traditional apprenticeships may even move into other untapped areas [8].

4.3 Function of Chamber of Industry and Commerce

Another outstanding characteristic of German dual system is the long-standing and highly regulated participation of the chamber [6]. Among the stakeholders of different properties in the dual system, the regional chamber represents the most core element of these functions, helping to ensure the result of vocational training is not "company-based", but the portable occupational. Training contracts must also be registered with the Chamber of Commerce [6]. This system is not fully regulated by the state alone, but is the result of a complex process of coordination between the state, enterprises and chambers, by taking into full consideration of the interests of the different stakeholders [4].

5. Conclusions

China's Ministry of Education has issued policies to provide thoughts, methods and financing support to vocational schools, in the form of which it is intended to meet the challenges and uncertainties of the labour market. German dual system is a role model for Chinese vocational system. The German dual system has been around for about 100 years and is the result of a concerted effort by various social groups. In the process of implementing collaboration between schools and enterprises, Chinese vocational colleges are not so much copying as "localization", combining China's education system and national conditions, with more flexibilities, taking its essence, injecting Chinese elements, and blossoming in the Chinese soil.

Except for localization of the dual system, China's vocational education, the same situation in Germany, is also under pressure from the academic sector. For students and parents, the academic sector is a golden path to high income and social reputation. For enterprises, the employment preference is more inclined to university graduates, which is actually rejecting vocational students [7]. In this case, "meritocracy", the growth of students participating in higher education courses, the dual system of student employment is threatened, which raises the challenge of vocational training to a new dimension.

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