

On the Development of Higher Vocational Education from the International Perspective

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Abstract. With the support of appropriate political and economic system, China's higher vocational education continues to push forward the education reform, optimize the education structure, and gradually clarify the development path in many directions. Based on the international perspective, combined with the practice of vocational education in Germany and Singapore, this paper makes some contributions to the development of world-class higher vocational education with Chinese characteristics: building a complete vocational education system with lifelong education thought and vocational ability training as the center; improving laws and regulations to promote the convergence of vocational education and industry; activating the main body of vocational colleges. We should strengthen the practical operation ability of teachers, build a team of double qualified vocational education, guide the "work project" to activate the curriculum and internalize the theoretical knowledge in practice.

In the magnificent development of China's reform and opening up, the development focus of vocational education has gradually changed from the denotative development to the connotative construction, and a development path with Chinese characteristics has emerged.

1. The Historical Context and Development Trend of Higher Vocational Education in China

Since the Reform and Opening Up in China, under the guidance of the government's macro policies, China's vocational education has achieved a historical leap from the extension development to the connotation construction. The development path, from the top to the bottom and from the outside to the inside, presents obvious "externality", which constitutes the "Chinese mode" of vocational education development: driven by the external needs of social development and economic construction, relying on the top-level design, financial support and administrative promotion of the government, and with the help of the top-down management system of the department, the internal transformation of vocational education is realized. After more than 40 years of exploration and practice, vocational education has completed the historic leap of "adjusting the structure, setting the model, expanding the scale and emphasizing the quality", which has made an important contribution to China's economic construction and social development.

The development history of higher vocational education in China is mainly reflected in four stages: the extension development with the adjustment of education structure as the core (1978-1989); the leap-forward development with the service economy as the main task (1990-1998); the extraordinary development with the background of "college enrollment expansion" (1999-2008); the connotation development with the construction of modern vocational education system as the axis (2009-). The close dialectical relationship between vocational education and economic and social development is organically combined, which is endowed with distinct personality and value. On the one hand, the shaping of higher vocational education by the development of economy and society has made higher vocational education have obvious industry characteristics and enhanced the ability of higher vocational colleges to serve local characteristic and advantageous industries; on the other hand, higher vocational education is often based on the development of social regions, with the guidance of

strengthening the service society, and the denseness of social and economic ties has further promoted China's economy economic and social development.

From the historical context of the development of vocational education in China, the basic ability of higher vocational colleges at the edge of the education system has been significantly improved, the integration of industry and education, the continuous deepening of college- enterprise cooperation, the gradual participation of industrial enterprises in higher vocational education, higher vocational education has fully played the role of optimizing the structure of higher education and leading secondary vocational education. With the promulgation and implementation of Vocational Education Law in 1996 and Higher Education Law in 1998, the state vigorously promotes the popularization of higher education and speeds up the development of vocational education. As an important level of vocational education and an important type of higher education, higher vocational education has gained new development. In the "new higher vocational education" stage, after the construction of national demonstration colleges, national backbone colleges and high-quality colleges, the contribution of higher vocational education to economic development and industrial upgrading has been significantly enhanced, which has greatly promoted the popularization of higher education in China and played a leading role in the construction of modern vocational education system.

2. The Colorful Impression of International Vocational Education

In the new era of higher vocational education, China's vocational education, in the international comparison, has firm confidence, takes advantages of all people, actively explores and forms its own characteristics of higher vocational education mode and system mechanism, and realizes the dual demands of youth to accept higher education and learn technical skills, which not only adapts to China's historical tradition, culture, nationality and national conditions, but also conforms to the feelings and attitudes of the public. The degree and tendency are consistent. China's higher vocational education is based on the national conditions and social conditions, and is constantly improving in actively learning from the successful and beneficial experience at home and abroad. The impression of "dual system" in Germany and "teaching factory" in Singapore is of great significance to explore the development of higher vocational education in China.

2.1 German "Dual System" Vocational Education

Germany's "dual system" vocational education has trained a large number of top-notch application-oriented technical personnel for Germany. It is known as the "secret weapon" for Germany's economic development after World War II. Its strict and complete management mechanism, sound legal system and perfect supervision system are highly praised by all countries in the world.

2.1.1 The Government, the Bank, the Enterprise and the College are Linked in Many Ways, Taking the Enterprise as the Leading Role.

The success of Germany's "dual system" education benefits from the support of the government (including the federal government and the state government) and the linkage of industry associations, enterprises and vocational colleges. Among them, the federal government and the state government are in the core position. With the participation of the employers' association and the employees' association (collectively referred to as the "federal teaching institute"), they formulate the vocational training framework and laws and regulations, provide the enterprises with training qualification with corresponding tax reduction policies, and pay the students in full; the industry association formulates detailed training regulations according to the training plan of the state government, including the trainers. Enterprises play a leading role in arranging vocational colleges for students to learn theoretical knowledge during the training period and pay corresponding salaries according to laws and regulations. As an important department to ensure the effective cooperation among enterprises, trainees and colleges, the industry association is responsible for supervising the implementation, providing training

consultation, fully protecting the interests of students from infringement, and assessing students and issuing industry qualification certificates after the training.

2.1.2 Guided by "Professional Activities", Practice and Theoretical Learning Alternate

The course mode of "dual system" adopts the "dual mode" of colleges and enterprises, which is based on the cultivation of professional ability. In the course setting, it is mainly guided by "professional activities" in enterprises. Students need to complete 60% - 70% skill training in enterprises, and receive 30% - 40% professional theoretical knowledge and general courses in colleges. Within one week, students will spend three days to practice their professional activities in enterprises and two days to learn knowledge in colleges, so as to realize the alternation of practical environment and theoretical learning environment, ensure that students find problems, think about problems and learn theoretical knowledge more purposefully in task orientation.

2.1.3 Strictly Standardize the Assessment System and Evaluation System, and Issue the Entry Permit after Passing the Assessment

Germany's high-quality "dual system" vocational training education relies on a standardized, objective, fair, authoritative and perfect assessment system and evaluation system. The main industry associations are responsible for the assessment of vocational education achievements, the recognition of skills and the issuance of relevant certificates in Germany. The performance assessment is divided into mid-term assessment and final assessment, mainly including written examination and practical skills operation. The college is responsible for organizing and implementing the written theory examination, and the trade association is responsible for organizing the skill examination. Each examination content is attached with detailed process evaluation and quantitative standards. The mid-term assessment can not only check the basic theoretical knowledge, practical skills and proficiency of students, but also test the teaching level and quality of vocational teachers, find out the problems in teaching and training, so as to improve the quality of training. The students who pass the theoretical assessment will obtain the relevant graduation certificate and degree certificate issued by the college; the students who pass the skill assessment can obtain the post qualification certificate recognized by the country, various industries and European Community countries issued by the industry association.

2.1.4 Professional and Skilled Teachers

The professionalization of teaching staff is an important guarantee for the high quality of German "dual system" vocational education. According to a series of strict requirements, German "dual system" vocational education selects theoretical and practical teachers, and conducts irregular "charging" training and assessment. Teachers of theoretical courses in vocational colleges must meet four requirements: first, they have graduated from University; second, they have received vocational training; third, if they are male, they are required to participate in social welfare activities or military service; fourth, they have received teacher qualification training. Teachers of practical courses also need to have three conditions: first, working experience, second, vocational training, and finally, technician qualification or passing the AEVO (Ausbilder Eignungsverordnung) examination of the industry association. It is precisely because the teachers of German "dual system" vocational education have solid theoretical foundation, rich practical experience, exquisite operation skills and excellent professional quality, so they can teach the most advanced technology, the latest theoretical knowledge and the most advanced technology to students, and cultivate a group of practical talents of high level for the country.

2.2 Singapore's "Two Track System" and "Teaching Factory" Model

The biggest characteristic of Singapore's vocational education is to pay attention to dredge the contact channels between the supply and demand of Vocational and technical talents. The vocational education department can set up education goals according to the demand of talents and cultivate qualified talents that meet the needs of the society. There is a close relationship between the supply

education and demand of vocational and technical talents: the vocational community reflects the demand for vocational and technical talents to the education community through certain channels, and the education community takes the demand of the vocational community as the training goal of students, and obtains the support of the vocational community. In the aspect of practical teaching, a two track system of practice and training is gradually formed.

2.2.1. Close to Industry and Optimize Curriculum Development Management

Singapore's vocational education, on the one hand, follows the upgrading of industrial structure and timely adjusts the focus and direction of vocational skills training, on the other hand, according to the advanced technical requirements of multinational companies investing in Singapore, pays attention to the development and management of training courses in advance.

The types of training courses include:

A. Professional skills development courses, which should be supported by government agencies in response to the market demand for professional talents.

B. according to the needs of individual enterprises, enterprises provide tailor-made courses, and establish training partnerships with enterprises, serving a large number of people, including government agencies and business people.

C. The on-the-job technical retraining course is implemented by the Federation of workers and staff of Singapore and supported by grants from the economic development board and the productivity standards board to provide skills upgrading courses for on-the-job staff.

D. The advanced diploma can meet the requirements of industrial and commercial enterprises' development and training, and provide full-time and part-time courses for the employees.

2.2.2 "Teaching Factory" and "Project Oriented" Learning with the Same Teaching Environment and Factory Environment

"Teaching factory" provides vocational college students with a learning environment with practical situation, aiming to cultivate the practical ability, innovation ability and team spirit of students in Polytechnic, and improve their ability to solve practical problems. The construction of "teaching factory" which is consistent with the teaching environment and factory environment makes the students' teaching activities in the college feel like they are in the real factory. The teaching factory introduces the actual enterprise environment into the college teaching, and creates the teaching environment with advanced technology and complete equipment in the college. Meanwhile, the college continuously introduces their production items through cooperative enterprises objectives and R & D projects form a comprehensive teaching mode integrating schools, teaching factories and enterprises, so that enterprise internships, enterprise projects and school teaching can be organically combined, so that students can better adapt to the professional jobs of enterprises when they graduate.

2.2.3 To Promote the Development of Teachers' Systematic Ability under the Guidance of Boundless and Full Cycle

Boundless strengthen teachers' soft skills, focus on teamwork and communication, and emphasize that every teacher is a part of the project team. Strengthen the teachers' hard skills in the whole cycle, and pay attention to the core competitiveness and skills improvement. The first is to provide more opportunities for comprehensive technological innovation and application, strengthen team cooperation between different departments and departments, and promote project cooperation and exchange of teaching activities among different departments. The second is to divide project types (such as small projects, Department projects, system projects, comprehensive projects, etc.), establish different technical service teams in a targeted way, carry out multi ability combination across disciplines, centers and departments, and let teachers cultivate core competitiveness in project cooperation. Third, actively participate in and carry out all kinds of innovation and entrepreneurship and skills competition projects. This kind of project is more professional, forward-looking and competitive, team training is stronger, and requires more scientific, normative and standard, which can achieve the purpose of promoting teaching and learning by competition.

3. Challenges of Higher Vocational Education in China

With the recent development of China's higher vocational education, it has played a significant role in the development of social economy. However, on the threshold of new era and new talent training, facing the new requirements of the new era for the function of China's vocational education, compared with the world-class vocational education, it still faces greater challenges.

3.1 Lack of Coordination Mechanism Among Government, Industry and College, and Poor Connection Between Industry and Vocational Education

The development of higher vocational education in our country lacks the cooperation and participation with industry enterprises, the legal protection and the management and supervision of industry associations. Enterprises do not take the responsibility of training talents. Although the education law of our country proposes that enterprises should participate in the training of social talents, it is not included in the law and there is no relevant reward and punishment measure. On the one hand, it is difficult for enterprises to stimulate their enthusiasm to participate in vocational education due to the lack of corresponding policies. On the other hand, the contact and cooperation between colleges and enterprises need the supervision and coordination of specialized agencies, similar to the function of German Industry Association, which is still a blank in China at present. Colleges and enterprises cannot build a lasting and stable relationship, and students' interests cannot be guaranteed. The lack of coordination mechanism among government, enterprises and colleges has become a bottleneck restricting the development of higher vocational education in China.

3.2 The Proportion of Practical Courses is Low, and the Real Situation of Students' Vocational Ability Training is Lack

The teaching mode of vocational education in our country often focuses on the transmission of theoretical knowledge. Although there are practical training courses, they occupy less time of students' courses. The content of the training courses is often focused on the single affairs that can be completed in a short time. The construction of the real situation lacks a platform, and the practical operation ability of students is difficult to be fully exercised. Vocational education lacks the infiltration of industries and enterprises, and the implementation of school enterprise cooperation mechanism is not perfect. As a result, most of the students learn the knowledge and skills in the classroom and training room, and lack of learning and mastering the overall vocational skills.

3.3 Lack of Professional Experience of Teachers and Imperfect Construction Mechanism of Double Qualified Teachers

Higher vocational education, as a type of vocational education for training application-oriented talents, has higher requirements for the richness of practical experience of teachers. However, the requirements for teachers in higher vocational colleges tend to have higher education background and scientific research ability, while ignoring industry experience. Compared with most teachers, they have low social participation and lack of practical experience and practical ability. From an objective point of view, the heavy burden of teachers' teaching work, promotion follow the professional title evaluation and employment standards of undergraduate colleges and universities, the assessment is too heavy on scientific research results, resulting in the reluctance of teachers to spend more energy on practical learning. At present, the selection and promotion assessment system of teachers' conditions in China cannot meet the requirements of the construction of teachers' team in higher vocational education.

4. The Way to Improve the Soft Power of Higher Vocational Education in China

Higher vocational education is of great significance to the education system and social service of our country. Although the development of foreign vocational education mode is quite mature, it can not be

completely copied, nor can it be achieved overnight. It is necessary to build a world-class higher vocational education with Chinese characteristics according to China's basic national conditions.

4.1 Build a Complete Vocational Education System with Lifelong Education Thought and Vocational Ability Training as the Center

Under the guidance of lifelong education, we should pay attention to the cultivation of students' comprehensive quality and ability, fully consider the needs of students' employment or further education, and establish a complete vocational education system with vertical and horizontal connection and mutual communication, which can effectively promote the development of education towards popularization and vertical deepening. First, vocational education workers must change their ideas, cultivate students' communication ability, team spirit, social skills, entrepreneurship, etc.; second, integrate all kinds of education resources, strengthen the vertical and horizontal communication between education resources, and the education department should formulate reasonable protection measures, improve and strengthen the connection and mutual cooperation between all kinds of education, and establish a management organization to be responsible for their duties. The work of teaching connection and communication will further promote China's vocational education to be socialized, open and multifunctional, and build a complete vocational education system.

4.2 Perfect Laws and Policies, Promote the Link Between Vocational Education and Industry

Relevant laws and regulations have been issued to take enterprises as the main body to participate in the task of talent training in Colleges and universities. At the same time, policy support or assistance has been given to enterprises actively participating in talent training, and policies have been used to encourage enterprises to participate in the enthusiasm and initiative of "college enterprise cooperation". The industry can rely on the government to formulate and improve the system of employment with certificates and the system of vocational qualification assessment, strictly enforce the assessment procedures, strictly control the examination quality, improve the gold content of the certificate, and make the vocational qualification certificate a necessary condition for workers to work. The government can also make great efforts to provide financial support and set up special project funds to provide financial guarantee for "school enterprise cooperation".

4.3 Activate the Main Action Force of Higher Vocational Colleges and Actively Carry out the Cooperation Between Schools and Enterprises

From the current situation of our country, enterprises can not become the main body of higher vocational education, but also need schools to implement "college enterprise cooperation" as a major development plan and project. College should become leaders, actively contact and invite enterprises to cooperate, propose to position the relationship between vocational colleges and industry enterprises with partners, and sign a joint construction agreement with legal effect. Its content is not only limited to the cultivation of students by enterprises, but also extends to the co construction services of colleges and enterprises to achieve win-win results for both sides. For example, the college creates "customized class" for the enterprises in need, trains the students with intention from the time of enrollment, enters the "customized class" through two-way selection, and the curriculum outline of "customized class" is based on the needs of the cooperative enterprise. The college teaching and enterprise teaching set up courses in the corresponding proportion to learn theoretical knowledge and practical operation of the enterprise in school, The graduation examination is carried out by the enterprise and the school together. The qualified student enterprises can be directly employed. On the one hand, it solves the worries of the students' employment. On the other hand, it makes the enterprise feel that they are not only the investors of vocational training, but also the biggest beneficiaries.

4.4 Strengthen the Practical Operation Ability of Teachers and Build a Team of Vocational Education with Double Teachers

In the process of cooperation between production and learning, the advantages of vocational colleges lie in the teachers and the talents they cultivate. Vocational colleges should not only attach importance to teachers' professional skills, but also to teachers' practical ability. The lack of practical operation ability of teachers is not only an important factor affecting the cooperation between colleges and enterprises, but also a key factor restricting the cultivation of excellent talents. At present, about half of the teachers in China's vocational colleges come from college graduates. These teachers who come to the stage directly from the college have solid basic theoretical knowledge, but their practical ability is extremely deficient. Therefore, China's vocational colleges should employ experts or entrepreneurs with rich practical experience to give lectures or teach courses in schools through on-the-job education. In order to improve the educational level of teachers, it is urgent to add strengthen the training of teachers' practical operation ability.

4.5 Guide "Work Project" to Activate Curriculum and Internalize Theoretical Knowledge in Practice

The course uses "project-based" teaching and working situation mode to introduce the teaching process. It will bring the problems encountered in the enterprise to the classroom to answer questions and solve doubts in a targeted way, so that the theories learned by the students can be transformed into practice and the theoretical knowledge can be internalized in practice. Strengthening the "work project" can provide a logical starting point and fundamental point for practical teaching. The sustainability and continuous transformation of the project can ensure the sound operation of practical teaching. In particular, the expansion project can not only serve more enterprises, but also be converted into teaching projects, so that teachers and students can participate in the development together, reduce costs, and at the same time, it is conducive to the subsequent staff skills training. The curriculum is "work project" oriented, and the syllabus needs to seek the opinions of the enterprise to meet the needs of the enterprise. We should pay attention to the on-the-job training of students, let students contact the working environment earlier, grasp the theoretical focus in the working environment, and improve the purpose of learning.

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