

A Literature Review of the Development History and Level of School-Enterprise Cooperation in China' Technical & Vocational Education

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Abstract

As an important path and institutional arrangement for the development of Technical & Vocational Education(TVE) in China, School-Enterprise Cooperation(S-EC) has always received a great deal of attention. Nowadays, in China, S-EC in cultivating talents as an important form of cooperative education has been widely emphasized by the TVE sector. The term S-EC has become one of the most frequent words in the field of TVE and its reform and innovation are unprecedented. S-EC has been widely carried out in the field of TVE, and it is also one of the important development modes for enterprises and vocational colleges to develop and grow. The development history and level of S-EC in China's TVE reflect the state's emphasis on TVE and the continuous evolution of policies. This study first reviews the development history of S-EC in TVE in China, from the Opium War to the period of the Founding of New China, to the Period of the Planned Economic System and the Period of the Market Economic System. By analyzing the profiles of S-EC in TVE at each stage, it summarizes the different characteristics of S-EC at different stages and determines the development level of S-EC in China at the present stage, so as to lay a solid theoretical foundation for further research on the effectiveness of S-EC in TVE.

Keywords: Technical & Vocational Education, School-Enterprise Cooperation, Development Level, Development History

Introduction

Any form of research on the analysis of the current situation and future expectations is bound to bear the traces of historical experience. S-EC in TVE, as an educational phenomenon, is a product of history, changing and developing with the change of historical conditions, therefore, the study of it must take history as the coordinates for a dynamic examination. The education system is holistic and universal, a more formal code of conduct, manifesting itself

as a normative system, which is constituted in different ways, but the connection between them is stable and organic(Xie, 2000). This study firstly combs and analyzes the development history of China's S-EC in TVE in more detail from a historical perspective, takes time as the dimension and the changes in different institutional stages of China's economic and social development as the boundary, and roughly divides the development history of China's S-EC in TVE into three stages for discussion, and summarizes the development characteristics of the S-EC in TVE in each stage of development on the basis of which the development characteristics of the S-EC in TVE are summarized, which enrich to a certain extent the historical research on the development of China's S-EC in TVE to a certain extent. Finally, it divides China's S-EC in TVE into three development levels, and clarifies the current stage of China's S-EC in TVE so as to make a theoretical contribution to the establishment of reasonable evaluation criteria for judging the effectiveness of China's S-EC in TVE in the direction of deeper and more meaningful development. This paper provides a general description and introduction of S-EC in TVE in China, thus laying a solid foundation for further research on the effectiveness of S-EC in TVE.

School-Enterprise Cooperation in China's Technical & Vocational Education from the Opium War to the Founding of New China

The starting point of S-EC in TVE in China was the establishment of the Fujian Shipbuilding Academy in the mid-nineteenth century.

Overview of the Cooperation

Along with the emergence of China's national modern industry, S-EC in TVE develops from sprouting to arising. The outbreak of the Opium War and its defeat gave birth to the development of China's modern military industry. From 1845 to 1860, 25 ship repairing factories or workshops were established in China(Link, 2004). In the following years, the Qing government successively established modernized military factories in Anqing and Shanghai along the Yangtze River, as well as in Suzhou, Nanjing, Fuzhou, and Tianjin in the north, etc. In 1866, Zuo Zongtang founded the Qiushi Art Bureau based on the shipyards in Fuzhou, which became the first school for TVE in modern China, and was renamed the "Fujian Shipwrights' Academy" in 1867. In 1867, it was renamed as "Fujian Shipbuilding Academy", and the main goal of talent training was to emphasize on cultivating students' shipbuilding skills and driving skills. According to the relevant data, through the careful training of the academy, "the students specialized in shipbuilding have mastered the practical knowledge of the specialty, and most of them are close to the level of engineers, and the students specialized in piloting have attained the cultivation goal of offshore navigation, of which 14 students have the ability to sail far away from the sea, and there are also 3 students who act as teachers and interpreters, and 14 who act as captains of the ships(Lin, 1999). The founding and development of Fujian Shipbuilding Academy is closely linked with the development of China's shipbuilding industry, which is the beginning of the combination of modern school education and industrial production in China and at the same time, it also indicates the beginning of S-EC in TVE in China. Relying on the shipyard, Fujian Shipyard School integrates the school and the factory, where students learn theoretical knowledge in the school and operate on site in the shipyard. The students "spend several hours a day in the factory with the workers, familiarizing themselves with the actual details of the various engines and tools," so that they can prepare construction drawings and specifications for the various machine parts, and become drawing and designing talents who are well versed in the principles of design, and

familiar with the structure of the machines and the process of production". This combination of theory and practice was the beginning of the S-EC model of TVE. It is worth noting that, due to the needs of enterprise production, most of the industrial schools, industrial cram schools and industrial instructors' workshops were basically dependent on the industrial companies or enterprises to which they belonged.

The period from 1900 to the founding of New China, a period of about 40 years, was an important period of social change in China. The promulgation of the Imjin School System, in which TVE replaced industrial education and established the beginnings of a TVE system. As China's modern industry continued to brew and develop, various types of vocational schools for agriculture, industry, and commerce were established, easing the tension between factories and enterprises, which led to the fact that enterprises no longer needed to establish vocational schools to alleviate the lack of labor. According to the relevant information, in the Republic of China government has published the *Industrial School Order*, the *Guideline for Vocational Schools and Construction Organizations* and other statutes, programs to guide the vocational school to implement a good combination of the teaching process. For example, in the China Vocational School, which was founded in 1918, the school provides students with internships and guarantees internship hours by setting up various workshops of its own.

Characteristics of the Cooperation

In summary, it can be seen that the period from the Opium War to the Republic of China is the period of germination and initial development of S-EC in TVE in China. Whether it was the early academies or the later four types of industrial academies, their establishment and management were all dependent on the enterprises or factories to which they belonged. Enterprises became the leading parties of TVE, and everything was centered on the interests of enterprises, and the purpose of S-EC in TVE was to cultivate talents needed by enterprises and the society at that time. Although the level of S-EC in TVE in this period was not high, this kind of cooperation was the closest and the most primitive, mainly characterized by the enterprise-oriented model, insufficient standardization of S-EC in TVE, excessive attention to the cultivation of students and the setting of specialties on the knowledge and skills that were the most needed in China at that time, and to a certain degree, the content of general education was neglected. Vocational schools, in order to survive and adapt to the society, have slowly wandered away from the enterprises and formed their own system. Schools have become the dominant parties of TVE, and everything is done from the interests of the schools, centering on vocational schools and designing the teaching and production around vocational schools, and meeting the students' internships by organizing on-campus laboratories, on-campus workshops and farms. The main characteristics of the school-based S-EC model, the relationship between the two is relatively loose, and because of overemphasis on the systematic and complete professional knowledge, ignoring its practical nature, vocational schools and enterprises are drifting apart, TVE began to be far away from the enterprise and the market.

School-Enterprise Cooperation in China's Technical & Vocational Education during the Period of Planned Economic System

Between the founding of New China and the mid-1980s, China's socio-economic development went through such important historical periods as post-war reconstruction, socialist transformation and the Third Plenary Session of the Eleventh Central Committee. For

a period of time during the early years of the founding of the State, economic construction took precedence in the life of the country as a whole. The large-scale economic construction promoted the development of TVE. However, under the highly planned economic management system, S-EC in TVE in China showed another dynamic.

Overview of the Cooperation

In 1950, Premier Zhou Enlai pointed out in his speech at the National Conference on Higher Education that: "Now that our country's economy is in a stage of recovery, it is a fact that we need people who are 'in a hurry' and people who are 'specialized'. In order to facilitate contact with practice and meet the needs of construction, it is necessary and reasonable for the enterprise sector to organize short-term training courses or colleges" (Zhou, 1984). This meeting sent a strong signal for the industry to run schools and cultivate professional skills. From this time onwards, industrial enterprises have increasingly become the main force in organizing TVE and performing TVE functions on behalf of the state. Under this planned economic system, following the will of the state, in terms of production, resource allocation and the planning and arrangement of product consumption, all are planned and arranged in advance by the government, and the field of TVE is no exception. The specialized settings, specialized teaching contents and part-time teachers for specialized courses in secondary technical schools and technical schools shall be determined in accordance with the production needs of industrial enterprises and the technical requirements of industrial enterprises. For example, in July 1953, the Ministry of Higher Education issued the *Circular on the Principles of Setting Up Specializations in Secondary Technical Schools*, which required that "when formulating plans for setting up specializations in secondary technical schools (secondary vocational schools) under the auspices of the business departments, the specializations set up should strive to be centralized and single, and the specializations of the same school should be set up on the basis of the basic principle that they should be similar in nature. Set up a specialty should be near the school and professional nature of the same factories, mines and their business organizations as the basis. (Li, 1994) "Technical courses in secondary technical schools can be hired by the competent business departments from among the technicians of the subordinate enterprises or business units, and the establishment of a system of regular exchanges of teachers and technicians for technical courses on a trial basis (Gao, 2009). At that time, many students from economically disadvantaged families had strong opinions about not being able to continue their studies after graduation, so the new initiatives of Work-Study and Half-Work-Half-Study were introduced, which became one of the most important modes of S-EC in TVE during this period, and also became the core of the thinking of the first-generation Central Leadership Collective on TVE. Meanwhile, from the 1950s to the mid-1980s, industrial enterprises actively participated in S-EC in TVE, mainly in accepting students for production internships, accepting students for teaching internships in teaching factories and vigorously carrying out graduation internships. The number of specialized secondary schools and the number of students enrolled in them grew rapidly, and half-work and half-study schools and school-run factories blossomed all over the country.

Characteristics of the Cooperation

During the period of planned economy, the relationship between schools and the authorities of vocational colleges and enterprises has been relatively close, and the cooperative relationship between schools and enterprises in TVE has a strong administrative color. The cooperation between schools and enterprises often relied on the administrative

orders of the competent departments, and was a kind of planned cooperation. Under this mode of S-EC, which relies on administrative orders and has no conflict of interest between schools and enterprises, through the methods of "factory within a factory" and "factory within a school", industrial enterprises have been enthusiastic about organizing vocational education, and vocational schools have cooperated closely with enterprises. The main features of S-EC in TVE in this period are: the cooperation was carried out under the leadership of the government, with the industry or enterprise becoming the main body of TVE; the professional setting meets the needs of the industry and enterprise, and the degree of relevance was relatively high; the teachers were mostly technicians of the enterprise, and there was a close relationship between the two, but due to the over-emphasis on listening to the administrative orders, the autonomy of the vocational schools and the enterprises was restricted to a certain degree, and it was the product of a specific historical period.

School-Enterprise Cooperation in China's Technical & Vocational Education during the Period of Economic System

The successful convening of the Third Plenary Session of the Eleventh Central Committee corrected some of the erroneous practices of the past and emphasized the need to shift the focus of the State's work to the construction of socialist modernization. Since then, China has been in a period of transition in its economic system, and the reform of State-owned enterprises, with the establishment of a modern enterprise system as its focus, has gradually deepened. After the deepening reform, many forms and types of enterprises appeared in large numbers and developed rapidly, and government organizations underwent major adjustments and restructuring. The planned S-EC relationship was gradually weakening in the period of market economy construction, and the cooperative relationship between schools and enterprises was no longer as close as before.

Overview of the Cooperation

The convening of the 14th Party Congress marked the beginning of China's entry into the period of socialist market economy construction. Against the background of the state's requirement that enterprises should operate independently and be responsible for their own profits and losses in accordance with the law, and taking into account their own actual situation, the enthusiasm of many enterprises to participate in vocational education is gradually fading.

During this period, the guiding ideology, policies and modes of S-EC in China's TVE had been further developed and enriched. *The State Council Decision on the Great Development of Vocational and Technical Education* (1991), stated that "all kinds of TVE schools and training centers should, according to the needs of teaching and the conditions they possess, actively develop school-run industries and set up good production and practice bases. It advocates the combination of production and education, and the integration of work and study." The *Outline for the Reform and Development of Education in China* (1996), emphasized that "all types of TVE schools at all levels should take the initiative to adapt to the needs of local construction and the socialist market economy. Under the guidance of the government, they should advocate the joint operation of schools, take the way of combining production and education, make more use of loans to develop school-run industries, and enhance the ability of schools to develop themselves." The *Vocational Education Law of the People's Republic of China of 1999* gave a definite definition of "combining production and education," and stipulated the

connotation, service object, and training of talents. In 2005, the *Decision of the CPC Central Committee and the State Council on Deepening Educational Reform and Comprehensively Promoting Quality Education* and other policy documents further reflected the development of the combination of education and industry and S-EC in China during the construction of the socialist market economy. In 2014, China's market economic system was basically established, and the state re-recognized that it must attach great importance to industry/enterprises organizing or participating in TVE, and successively issued a number of policy guidelines to crack the dilemmas arising from S-EC at the present time. In 2018, the *Decision of the State Council on Greatly Promoting the Reform and Development of Vocational Education* put forward that "we should fully rely on enterprises to organize TVE, enterprises should organize vocational schools and vocational training institutions according to actual needs, enterprises should strengthen cooperation with vocational schools and implement various forms of joint schooling", and in 2022, General Secretary Xi Jinping gave important instructions to the National Vocational Education Work Conference, which pointed out that "It is necessary to insist on the integration of production and education, S-EC, the combination of work and study, and the unity of knowledge and practice, and guide all sectors of society, especially industrial enterprises, to actively support TVE". Under this favorable economic development environment and TVE policy environment, the integration of production and education in TVE and the combination of work and study have developed rapidly both in theory and practice, and S-EC has become an important part of the construction of a modern TVE system with Chinese characteristics and world-class.

Characteristics of the Cooperation

In the transition from a planned economy to a market economy, the market economy gradually emerged, "government and enterprise separation", "enterprise and education separation" measures, making the relationship between the school and the enterprise undergone a fundamental change. "Industry-related higher vocational colleges are divorced from the industry, and some colleges are gradually detached from the influence of the original industry in running the school, and the relationship with the industry from 'compatible' to 'separate', cutting the natural bond between the two.(Ouyang, 2017) " At this time, the mode of cooperation gradually shifted from the mode of "following only the needs of industry sectors" in the planned economy era to the mode of cooperation "oriented by market demand", and the cooperation mechanism gradually shifted from the planned mechanism to the market mechanism(Lan, 2013). The main feature of S-EC in TVE in this period was that a series of new explorations that had been started around the "combination of industry and education". Especially in the context of the connotation construction of higher vocational education and the current economic and social restructuring and modern industrial transformation and upgrading, the combination of production and education and S-EC in China's TVE had been given a new connotation, and S-EC had become a necessary way for higher vocational colleges and universities to run their schools, and S-EC in TVE had gained a wider space for development.

The Development Level of School-Enterprise Cooperation in China's Technical & Vocational Education at the Present Stage

On the basis of the existing research on the development level of S-EC in TVE, this study combines the above summary of the profiles and characteristics of the different development stages to further divide the development level of China's S-EC in TVE at this stage, in an

attempt to more comprehensively and accurately show the hierarchy of the development of China's S-EC in TVE. At the same time, the level of development of S-EC in China's TVE is identified, which provides an important research premise for the development of evaluation criteria for the effectiveness of S-EC in China's TVE.

Division of the Development Level of School-Enterprise Cooperation in China's Technical & Vocational Education

According to the Theory of Life Cycle, the life cycle of an enterprise can be divided into the start-up period, the growth period, the maturity period, and the sustainable development period (Sun, 2012). In different stages of the life cycle, the development of enterprises will show different characteristics. Like the life cycle of an enterprise, the development of S-EC also has to go through this kind of stage-by-stage growth process. S-EC in TVE is at a different level of development, and has different development characteristics, and the forms and contents of cooperation have to be changed accordingly, and the cooperation strategies and development measures adopted by S-EC will also be different. Combined with the above research, it can be seen that the content of S-EC and the degree of integration of professional training is an important basis for the development level of S-EC in TVE. Combined with the above criteria, this paper divides S-EC in TVE into three development levels:

The primary development level: it mainly solves the problems of enterprises employing workers and vocational colleges' students' skill learning and top job internship. As enterprises enter the development period, enterprises have a certain scale and strength, enterprises pay more and more attention to the development of talents, focusing on the cultivation of talents to support the strategy of enterprises, but this stage of S-EC is mainly manifested in the cooperation between vocational colleges and enterprises mainly on the teaching or teaching construction of a certain aspect of the cooperation, such as cooperation in the implementation of employment, cooperation in the internship and practical training of students, cooperation in the staff training, cooperation in the professional talent training program development, cooperation in internship training base construction, cooperation in curriculum construction or teaching resource library construction, cooperation in product research and development and technical services and so on (Guo, 2019). This kind of cooperation is single or unidirectional, short-term, and the purpose of S-EC is more for the needs of the enterprises to use labor.

The intermediate development level: it mainly solves the problems of new product development, enterprise staff training, teacher training, students' comprehensive quality training, and personnel exchanges between the schools and the enterprise. Schools and enterprises jointly invest manpower and material resources in the construction of a specialty or a specialty group, and send people from schools and enterprises to participate in the education, teaching and management of the specialty or the specialty group, including the joint formulation of professional personnel training programs, the construction of curricula and teaching resource library, the joint investment of manpower and material resources for the construction of on- and off-campus internship and training bases, the use of jointly built platforms to carry out staff training and technical services, and the joint sending of people to participate in the entire education, teaching and teaching management, and the joint implementation of students' entrepreneurship and employment. Jointly invest manpower and material in the construction of on- and off-campus internship and training bases, utilize

the jointly built platform to carry out employee training and technical services, jointly assign personnel to participate in the whole process of education and teaching and teaching management, and jointly implement student entrepreneurship and employment. This kind of cooperation emphasizes the participation of school and enterprise in the construction of specialty and teaching of specialty, the joint input of manpower and material resources of school and enterprise, and the school and enterprise can share the results of S-EC according to the size of the input and responsibilities. This kind of cooperation is two-way and long-term, and is a close and all-round cooperation.

Advanced development level: this is an in-depth integration stage that vocational colleges and enterprises cooperate deeply, in order to achieve the true meaning of S-EC - the establishment of a virtuous cycle of sustainable development mechanism, to achieve the optimal combination of educational resources, to achieve the overall effectiveness of schooling. This kind of cooperation is based on the all-round cooperation between schools and enterprises to determine the specialties and enrollment plans based on the human resource planning of the cooperative enterprises, and to formulate the professional personnel training standards, personnel training programs and curriculum teaching standards according to the employment requirements of the cooperative enterprises, and all the students meeting the graduation requirements will be employed in the cooperative enterprises, and the cooperative enterprises are the productive enterprises that directly employ the students(Jia, 2021). The purpose of enterprises participating in S-EC is to get human resources that meet the needs of enterprises. At this high-level stage of development of S-EC, it often combines the national economic restructuring, the construction of a modern vocational education system and the construction of a modern industrial system with the in-depth integration of S-EC, with the service of the economy and the society and the people's livelihood as the common goal of both parties, which is multidirectional or multifaceted, and a kind of in-depth integration rather than just cooperation.

Determination of the Development Level of School-Enterprise Cooperation in China's Technical & Vocational Education at the Present Stage

According to the life cycle theory, at each different stage of its life cycle, an enterprise presents different characteristics in terms of its development strategy, organizational characteristics and so on. For this reason, the cooperation between enterprises and vocational schools also accompanies the development of enterprises at different development levels and has different development characteristics(Adizes,1988). Meanwhile, according to the development characteristics of S-EC in TVE, generally speaking, the deeper the degree of enterprise participation in, the higher the development level of S-EC in TVE reach.

At present, the enthusiasm for S-EC in TVE in China is high, and the main manifestation is that labor-intensive enterprises are cooperating in student internships and training, employee training, and the establishment of joint colleges in cooperating institutions(Wang, 2018). The focus of enterprises is on the economic benefits of participating in S-EC and solving the needs of enterprises in terms of labor (Deng, 2023). Therefore, based on the current situation of the development of S-EC in TVE in China, and with reference to the previously identified criteria for the development level of S-EC, this study concludes that S-EC in TVE in China is at an advanced stage of the intermediate level of development and has become a bottleneck that restricts the development of TVE in China, and that the in-depth integration

of S-EC has remained at the conceptual level for many years, and that there is a need to establish a reasonable evaluation criteria for judging its effectiveness in order to make China's S-EC in TVE develop in the direction of deeper level and more connotation.

Conclusion

With the further transformation and restructuring of the economic structure, China's demand for highly skilled personnel is growing by leaps and bounds. Cultivating high-quality laborers and skilled personnel is an important goal of deepening the reform of TVE and a major mission of vocational colleges and universities (Wu, 2023). However, at the present stage, the cultivation of skilled talents in Chinese vocational colleges and universities is relatively inefficient. In the process of rapid socio-economic development, how can TVE effectively take up the responsibility of cultivating technical and skilled talents, improving the quality of TVE talent cultivation, and how to cope with the emergence of the problem of increasing shortage of technical and skilled talents? The way out can only be to enhance the effectiveness of S-EC in TVE, and the comprehensive and effective intervention of enterprises in the process of cultivating skilled personnel in vocational colleges and universities can help vocational colleges and universities realize the effective cultivation of skilled personnel (Qiu, 2022). Therefore, under the new historical conditions, enhancing the effectiveness of S-EC in TVE has become the demand of the times and the call of reality, and it is the inevitable choice of S-EC (Shi, 2018).

Taking time as the dimension and the changes in different institutional stages of China's economic and social development as the boundary, this study divides the development history of China's S-EC in TVE into three stages and systematically combs through the historical process of the development of China's S-EC in TVE. At the same time, on the basis of the existing research on the development level of S-EC in TVE, combining with the characteristics of the development at the present stage, the development level of China's S-EC in TVE was positioned, and the conclusion was drawn that China's S-EC in TVE was at the advanced stage of the intermediate development level. However, at present, the effectiveness of China's S-EC in TVE is not high, which directly affects the effective supply of technical and skilled talents in China. With the accelerated pace of China's industrial optimization and upgrading, there is an urgent need to vigorously strengthen the construction of technical and skilled talents, and the effectiveness of S-EC in TVE has attracted much attention. Therefore, to improve the effectiveness of S-EC in TVE has become a major problem that needs to be solved urgently, which is an inevitable choice to realize the effective cultivation of technical and skilled talents.

In conclusion, this study deepens the theoretical understanding of S-EC, delves into the social, economic and cultural context of S-EC in China, reveals the characteristics of the development of S-EC in different historical stages and policy environments, and provides theoretical support for practical operation. At the same time, by analyzing the characteristics and effects of S-EC at different stages of development, this study helps to clarify how S-EC can effectively promote the interface between education and industry, and then play a role in the national economic development strategy, which enriches the body of knowledge on S-EC at both the theoretical and practical levels, and at the same time provides important references and guidance for policy makers and education practitioners in the specific context of China.

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