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Research Article

Mechanism of Deepening the Cooperation between Schools and Enterprises in Higher Vocational Education*

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Abstract

In view of the problem that the cooperation between higher vocational schools and enterprises is not thorough enough, this paper demonstrates the necessity of cooperation between higher vocational schools and enterprises from the perspective of "construction of technical school" theory. Through the construction of higher vocational school-enterprise cooperative synergetic system model and analysis of its synergistic factors, this paper analyzes the internal order parameters and external control parameters related to school-enterprise cooperation. Under the concept of full-value chain, it uses enterprise colleges as the entry point to find out the improvement measures for deepening the cooperation between higher vocational schools and enterprises, and to promote the emergence of the synergistic effect of "1+1>2" in the cooperation between schools and enterprises.

Keywords

Higher Vocational Education • Technical School • School-Enterprise Cooperation • Enterprise College • Full Value Chain

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From the perspective of the nature of behavior, the cooperation between higher vocational schools and enterprises is the combination of production and education. According to the philosophy of education, the educational process and the productive labor process are two independent social processes in the external form, which are closely linked by technology in the internal form. It is an objective and inevitable social state in which human society develops into modern society under the background of large industrial technology demand, and it does not shift according to any human will. Therefore, school-enterprise cooperation is a combination of technology. Any subjective, man-made decision-making and forced implementation that deviate from its objective basis will inevitably lead to negative effects. At present, the national serial education plan has created a good social environment and policy environment for the sustainable development of higher vocational education. Due to the deep-rooted social concept of “prefer culture to technique, and a good scholar makes an official”, the social effect of brand vocational education has not yet been formed. Due to the unclear operational mechanism of the connotation deepening of the cooperation between schools and enterprises, the technology and talents of schools and enterprises are not connected; temporal, narrow and shallow cooperation between schools and enterprises is a prevalence existence, which highlights many negative phenomena such as “fragmentation, apparent, short-term, and fireplace phenomena” (Wang & Wang, 2014), and has caused many problems such as the curriculum system of higher vocational education is too simple, and it is not suitable for the training of inter-disciplinary talents; the teaching resources asynchronism and the industrial technology updating is not synchronized; the homogenization of talent cultivation is not consistent with the requirement of individualized teaching (Yang *et al.*, 2013). Based on the synergy and system theory, through the construction of the school-enterprise cooperative synergetic system model and the analysis of the system synergistic factors, the operational mechanism of the higher vocational school-enterprise cooperation deepening is clarified, and under the concept of full value chain, the school-enterprise cooperation system maximizes the synergistic effect of “1+1>2”.

The "construction of technical school" of higher vocational school-enterprise cooperation

Modern higher vocational education requires to found technical schools. The technical talents cultivated by higher vocational education should be seamlessly connected with the needs of social technical posts. To cultivate inter-disciplinary and innovative talents for the industrial transformation and upgrading and post technical innovation in the new era, the cultivation of professional skills, innovative ability and method ability of vocational students is inseparable from technology (Zhang & Wang, 2017). Modern higher vocational education requires teachers to have high-level abilities in producing, teaching, learning and researching, so the professional development of teachers is inseparable from technology. The technical connotation of higher vocational colleges is to build the building blocks of modern professional culture, to achieve school-enterprise collaborative innovation and social public services. In addition to the basic mission of cultivating technical talents, modern higher vocational education also undertakes social public service tasks such as helping enterprises to transform, professional qualifications, enterprise employee training, innovation and

entrepreneurship guidance, all of which are centered around technology. Higher vocational education is mainly based on production and application technology and it's close to the real production line. Production and application technology originates from enterprises and enterprises always stand at the forefront of the application technology. Therefore, in order to keep technology from falling behind, it is necessary for the higher vocational education to cooperate with enterprises to build a bridge of technical communication and trace the advanced technology of the enterprise, so technology is the entry point for school-enterprise cooperation, and school-enterprise cooperation is the only way for higher vocational education to "found technical schools". Only through school-enterprise cooperation, can higher vocational colleges have technical equipment and technical faculty required by the enterprise, so that it can cultivate technical talents needed by enterprises and achieve technical docking between schools and enterprises. Technology is the cornerstone of higher vocational education, and it is the supporting carrier of "win-win" for schools and enterprises. Only by firmly rooting the foundation of "construction of technical schools" in higher vocational education and stabilizing the "win-win" technology support carrier of school-enterprise cooperation can we deepen the connotation of school-enterprise cooperation and realize the sustainable development of school-enterprise cooperation. The theory of the foundation of "construction of technical schools" demonstrates the key role of school-enterprise cooperation in the high-quality education of modern higher vocational education (Chen, 2016).

The model of higher vocational school-enterprise cooperative synergetic system

According to the synergy and system theory, the school-enterprise cooperation in higher vocational education is a synergetic system formed by schools and enterprises to coordinate and cultivate high-quality skilled technical talents. Schools and enterprises are the subsystems for constructing the system, and the government and industry associations are external control parameters of the system, the macroscopic parameters of the collective movement generated by the cooperation between the schools and the enterprises are the internal order parameters of the system and they are random, which is the key factor determining the direction of the synergetic system. The internal subsystems of the synergetic system present a cross-integrated layout with a composite associated relationship. The power of the school-enterprise cooperation and the synergetic system is an effective and coordinated collaboration mechanism for schools and enterprise subsystems. Based on this, a self-organizing model of sustainable development is constructed to realize the synergistic effect of "1+1>2". According to the synergy theory, the shallow, narrow and short-term school-enterprise cooperation and synergetic system indicates that the self-organized mature model has not been established, and the long-term mechanism is lacking. It is necessary to determine the order of the synergetic system through the three major factors of schools, enterprises and government industry associations, so as to establish a school-enterprise cooperative synergetic model, implement interference with the movement direction of the synergetic system, and achieve sustainable coupling development of higher vocational school-enterprise cooperation. The prerequisite for the cooperation between higher vocational schools and enterprises is the appreciation of the interests of schools and enterprises. Since school culture and corporate culture belong to two different subcultures in social ideology, it is bound to cause disparity in the concept of schools and enterprises. Therefore, in order to establish a sustainable development mechanism for higher vocational school-enterprise cooperation,

the development goals of both schools and enterprises must be integrated into a unified synergetic development goal, with the maximization of interest-added effects as the entry point and connection point (Zhu, 2013).

From a systemic perspective, as a key subsystem in the school-enterprise cooperative synergetic system, input factors include people flow (teachers and students), information flow (government education policies and social requirements), logistics (teaching facilities), and capital flows (education funding), output factors include skilled technical talents and new technologies. It's the same for the subsystem enterprises, the input factors include people flow (enterprise talents), information flow (market information and new technologies), logistics (production equipment and raw materials) and capital flow (working capital), and output factors include products and services. Through the systematic analysis of schools and enterprises, it is not difficult to see that the output of the school subsystem is just the input of the enterprise subsystem (people flow and information flow), the output of the enterprise subsystem can become the input of the school subsystem (logistics), indicating that there is a connection between the two subsystems of schools and enterprises, that is, the talent and technology output of the school is taken as the input of the enterprise, creating economic value for the enterprise, the output of the products and services of the enterprise is taken as the input of the school, optimizing the teaching environment of the school, and cultivating high-quality skilled technical talents, therefore, through this connection point, the value-added effect of the school-enterprise interests can be fully utilized to form a loop-locked virtuous circle. Based on the perspective of synergy and system theory, the model of higher vocational school-enterprise cooperative synergetic system is shown as Figure 1, the model is only based on the lack of connection between talents and technology to achieve a stable union of the two subsystems of the schools and the enterprises, and the two subsystems are one-way flow systems in which the school is the giving party while the enterprise is the receiving party. We need to optimize and manage the leading roles of external control parameters and the internal order parameters in the school-enterprise cooperative synergetic system, change the direction of the school and the enterprise from one-way to two-way, and add more cooperative elements to the connection. Therefore, it is necessary to strengthen the system to exchange material, energy and information with the outside world, through an external control parameter, the government industry associations, and by their role of guiding, supervising and evaluating on financial support, public opinion and policies, it motivates the system to undergo an orderly change at the threshold of deep integration.

The cooperation process of the school-enterprise subsystem will produce order parameters, and the order parameters will govern the cooperative behavior of the school-enterprise subsystem. If the internal order parameters are formed, they become the key factors that determine the direction of the school-enterprise subsystem. In the school-enterprise cooperative synergetic system, schools and enterprises will produce a series of order parameters such as cooperation mode and cooperation interests and responsibilities in the process of mutual cooperation, which can strengthen the management and control of order parameters in technical cooperation and human resource cooperation, and stimulate financial donation, equipment sharing, technical support, qualification and certification, talent cultivation, faculty construction, information communication and other benefits, so as to achieve the "1+1> 2" synergistic effect of school-enterprise cooperative synergetic system.

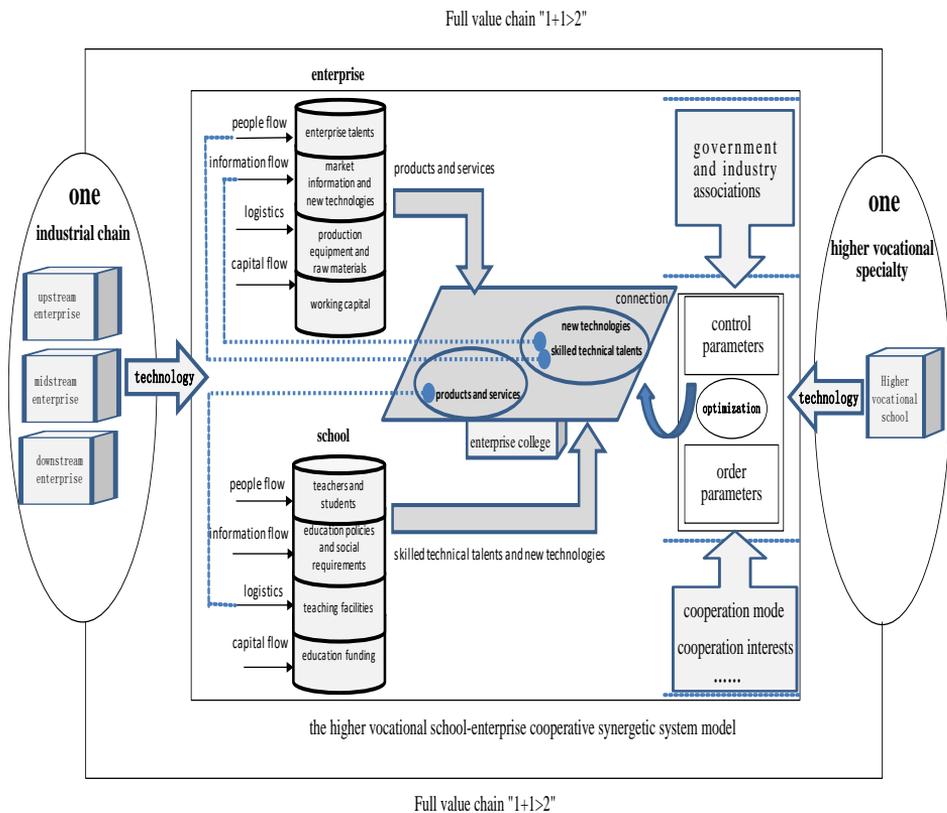


Figure 1. Mechanism diagram of the higher vocational school-enterprise cooperative synergetic system model.

Higher vocational school-enterprise cooperation under the full value chain

Enterprises in leading or pioneering positions in the industry chain, or enterprises with creativities often expand and differentiate many functions. When these functions exist within the enterprise, they will form an enterprise value chain. The creation of enterprise value chain is formed through a series of industrial activities. The enterprise industry chain and value chain are an organic whole, which are interlocked, mutually restrictive and interdependent. According to the higher vocational school-enterprise cooperative synergetic system model and combining with the cluster effect and chain effect theory, the cooperative enterprise is an important subsystem to maintain the stability of the system. Each enterprise is in a certain link in the industry chain, and each enterprise in the industry chain determines the development of the industry. At present, the upper, middle and lower reaches of most industry chain fail to form a joint force, which easily leads to the break of the industry value chain. The school-enterprise cooperative synergetic system model of school-enterprise cooperation is a kind of organism that promotes circulation and has the commonality connection of "technology" and "talent".

The cooperative enterprises in the school-enterprise cooperation system have the layout characteristics of the upper, middle and lower reaches of the industry chain. By making use of the “bonding” capacity between the schools and the government industry associations in the school-enterprise cooperation, we can easily bring into play the cohesive effect of the industry chain and the value chain, which makes up the shortcomings of insufficient joint force of enterprises in the industry value chain, and achieves enterprise linkages in all aspects of the industry chain. It not only effectively enhances the “robustness” of the school-enterprise cooperative synergetic system, but also effectively solve the problem of fragmentation of school-enterprise cooperation and homogenization of talent cultivation. The enterprise college is a platform established by enterprises to meet the demand for new technologies and new products and to output satisfactory talents (Li, 2017; Yan, 2016). In recent years, driven by the reform of modern vocational education, the enterprise college has developed a school-enterprise cooperation platform of school-enterprise multi-party management mode around cooperative school-running, cooperative education, cooperative development, and cooperative employment. Modern enterprise college has effectively integrated enterprise technology, human resources, culture, brand, public relations, customers and other full-value chain strategic resources, focusing on achieving business goals and business priorities, with dynamic capabilities and career development system, a scientific and rational organizational structure, as well as a mature corporate culture and clear strategic positioning. It strengthens the implementation of school-enterprise strategic thinking and the partnership of the enterprise supply chain, it is the “technology incubator” and “talent production line” of school-enterprise integration, therefore, enterprise college can realize the connection between enterprise industry chain and value chain based on technology and talents, it is a good carrier for the deepening of school-enterprise cooperation under the whole value chain. Through analysis of the higher vocational school-enterprise cooperative synergetic system model, the connection point between the school and the enterprise subsystems is the talent and the technology. The talent-cultivation technical level of the school must meet the technical standards required by the enterprises. After all, it is the technology that matters, so the grasp of school enterprise cooperation is technology. Technical docking is the premise of mutual benefit between schools and enterprises, it is also the guarantee of communication and restraint. According to the full value chain concept and system theory of enterprise colleges, enterprise college is an effective carrier of technology and talents in the school-enterprise connection in the model of higher vocational school-enterprise cooperative synergetic system, it is an industrial complex of value recreation and value transfer, ensuring the docking between profession and industry chain, and the docking between education and value chain.

Using the enterprise college as the carrier in the school-enterprise connection to expand the school-enterprise cooperative synergetic system model, under the concept of full value chain, optimizing the external control parameters and the internal order parameters of the system is the dynamic mechanism to promote the “1+1>2” synergistic effect of the school-enterprise cooperative synergetic system model. To play the “1+1>2” synergistic effect of school-enterprise cooperation, first of all, we need to identify the focus of school-enterprise technical cooperation, organically combine school and enterprise value chain resources, establish a long-term communication mechanism between schools and enterprises. Schools need to take the initiative to “go out”, implement strategies of geographical talent advantages and follow-up technical service advantages, and obtain the normal support of government industry associations and enterprises. The schools rely on the normal mechanism of the government industry association to enter the enterprise technology workshop, by constructing

the four “integration”: integration of managers and deans, integration of teachers and masters, integration of students and staffs, and integration of classrooms and workshops, meanwhile according to the functions and roles of enterprises in different links of the industry chain, they set up different enterprises to participate in professional teaching reform, curriculum system reform and curriculum development, faculty team improvement, experimental training room establishment, scientific research and social training, student outward bound training and other responsibilities and rights of value resource construction, so as to meet the needs of the corresponding professional ability level, and achieve a virtuous circle of mutual benefit between the schools and the enterprises. We should rely on the clustering and appeal of the modern enterprise college, aggregate N enterprises in the upper, middle and lower reaches of the industry chain to form a council of school-enterprise cooperation alliance council and establish a mechanism for optimizing the resources and interests of the council, focusing on “interest balance and unity, resource driven and distribution” to realize mutual sharing of school resources and enterprise resources, and mutual help and support of school interests and corporate interests, according to the pattern of “enterprise as main body, market as orientation, with association of industry, learning and research, and with government support” to implement docking to local economic society, docking to technical development and creation, docking to industrial transformation and upgrading, so as to promote cooperation between industry, learning, research and training.

Conclusion

Higher vocational school-enterprise cooperation is a complex system. Through the guidance of government industry associations, enterprises are fully aware that school-enterprise cooperation is the entry point for enterprise innovation, and the talents and technology are the strong driving force for school-enterprise cooperation. The schools and enterprises have reached a willingness to cooperate in terms of cooperation purposes, cooperation conditions, and cooperation significance. Through the promotion of government industry associations, schools and enterprises build information communication platforms, and discuss cooperation content, cooperation methods, and the responsibilities and interests of cooperation. After the cooperation goal is unified, it enters the primary stage of school-enterprise cooperation, and then optimizes the synergistic elements of the primary school-enterprise cooperative synergetic system in multiple dimensions, and establishes the dynamic mechanism of school-enterprise cooperation guided by technology and talents under the concept of full value chain, promotes deeper integration of school-enterprise cooperation.

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