

DEVELOPMENT OF SCHOOL-ENTERPRISE COOPERATION CURRICULUM FOR NEW ENERGY VEHICLE PROJECT IN MIDDLE SCHOOL

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Abstract

Along with the continuous development of the times and society, China's environmental problems are becoming more and more serious. In this case, China's energy problems are also getting more and more serious, and in order to improve the energy shortage scientifically, new energy vehicle technology is promoted. At the same time, the emergence of new technologies also means the demand for new talents. Therefore, China has put forward a greater demand and higher requirements for new energy vehicle technology talents. At present, one of the important ways for secondary schools to realize the combination of teaching and practice is to be able to provide students with greater practical opportunities on the basis of theoretical teaching, to enhance students' innovation consciousness and entrepreneurial ability, to enhance employment stability, and to carry out cooperation between schools and enterprises to develop the curriculum has become a key to curriculum reform. However, there are various problems and obstacles in the actual school-enterprise cooperation curriculum development. This paper takes school-enterprise cooperation curriculum development in secondary vocational schools as the main research object, and deciphers the process of developing curriculum projects between Hangzhou Technical School and new energy enterprises by means of case studies, so as to investigate and study the school-enterprise cooperation curriculum development by using questionnaires and interviews with teachers, students, school and enterprise leaders in secondary schools, analyze the problems of school-enterprise cooperation curriculum development, and analyze the causes of the problems from the levels of government, enterprises and schools.

Keywords: Middle school, Curriculum development, School-enterprise cooperation

Statement of the problems

The connotation and forms of cooperation between secondary schools and enterprises are rich and diverse. The cooperation between schools and enterprises in curriculum development is not only the basis for cultivating talents needed by schools and enterprises, but also the guarantee of long-term cooperation between schools and enterprises, so the cooperation in curriculum development becomes the key to cooperation between both sides. Nowadays, most secondary colleges and universities have conducted curriculum development with enterprises, but in reality, there are many factors that affect the effect of school-enterprise cooperation in curriculum development. However, in reality, there are many factors affecting the effect of school-enterprise curriculum development, such as the low enthusiasm of enterprises to participate in school-enterprise curriculum development, the deviation of school-enterprise curriculum development concept, the resistance of teachers and experts to participate in curriculum development, the lack of resources for school-enterprise curriculum development, and the lack of stable and long-term guarantee mechanism for school-enterprise cooperation. The reason for these problems is that in the field of vocational education, the government lacks strong supervision and monitoring on the development of school-enterprise cooperative courses; without the support and backing of the policy system,

enterprises lack the motivation to participate in the development of the courses; the leaders of secondary schools lack an overall understanding of the development of the courses, which leads to the existing school-enterprise cooperation being mostly formal, making the development of school-enterprise cooperative courses still in the process of exploration. Therefore, the development of school-enterprise cooperative courses is still in the process of exploration. Therefore, there are many issues that need to be discussed and clarified, including the roles and functions of government, enterprises and schools, how to establish a tripartite cooperation relationship, how to establish the curriculum development concept in response to social reality and students' needs, as well as the professional and vocational construction of the curriculum development faculty, the full co-creation and co-construction of curriculum development resources, the long-term interaction between schools and enterprises and the construction of the cooperation guarantee mechanism, etc.

Research objectives

The curriculum development studied in this paper refers to the whole working process of determining curriculum objectives through needs analysis, selecting and designing teaching contents and arranging related teaching activities according to this objective in order to finally achieve the curriculum objectives.

Research Hypotheses

This paper takes the school-enterprise cooperative curriculum development in secondary vocational schools as the main research object, and deciphers the process of developing curriculum projects between Hangzhou Technical School and new energy enterprises by means of case studies, so as to use the research methods of questionnaires and interviews to investigate and study the school-enterprise cooperative curriculum development of teachers, students, school and enterprise leaders in secondary schools, and analyze the problems of school-enterprise cooperative curriculum development: enterprises We analyze the problems of school-enterprise cooperative curriculum development: low enthusiasm of enterprises to participate in school-enterprise curriculum development, deviation in the concept of school-enterprise cooperative curriculum development, resistance of teachers and experts to participate in curriculum development, lack of resources for school-enterprise cooperative curriculum development, lack of stable and long-term guarantee mechanism for school-enterprise cooperation, etc. We also analyze the reasons for the problems from the levels of government, enterprises and schools.

Literature Reviews

The data of the papers used in this study were mainly obtained from CNKI periodicals network and Wipu Chinese science and technology database. In the database, the research results from 2009 to May 2019 were searched, and the keywords "curriculum development", "school-enterprise cooperation curriculum development", "secondary school-enterprise cooperation curriculum development" were used as fuzzy search. The keywords "curriculum development", "school-enterprise cooperative curriculum development" and "secondary school-enterprise cooperative curriculum development" were used as fuzzy search. A total of 14,789 papers and 2,115 dissertations on "curriculum development" were searched, 282 papers on "school-enterprise cooperative curriculum development" and only 49 papers on "secondary school-enterprise cooperative curriculum development". There are only 49 papers on "secondary school-enterprise cooperative curriculum development". By screening the research results, excluding the duplicate publications, irrelevant, news reports, call for papers, etc., we got 220 valid papers. After screening the research results, there were 220 valid papers. In

addition, we checked 11 monographs related to "school-enterprise cooperative curriculum development" and conducted related research. In addition, 11 monographs related to "school-enterprise cooperative curriculum development" were reviewed, and the relevant studies were reviewed.

Scholars have analyzed the current problems of school-enterprise cooperative curriculum development in vocational education from different perspectives. Gao Fan in "The Inspiration of Competence for Curriculum Reform in Vocational Education" points out that in terms of curriculum development, there are various curriculum development models implemented in vocational education in China, but in actual operation, they do not achieve the desired effect, and the technically skilled talents trained by vocational schools still do not meet the requirements of enterprises. The main problems are: the vocational and professional content of vocational education curriculum is weak, the construction of professional teaching standards needs to be improved, and the construction of supporting learning resources is insufficient.

Nowadays, under the continuous development of China's education field, secondary schools are facing greater market competition. Many students will have certain considerations when choosing a school, and most of them will choose high school to continue their studies and then continuously improve their theoretical knowledge and skills. Under the background of rapid development of new energy vehicles, if secondary schools can seize this opportunity to cultivate professional and technical talents, they can provide more professional talents for the whole society and field. This can improve the competitiveness of secondary schools, facilitate subsequent enrollment, and enhance the status of secondary schools in the field of education, so that the corresponding enterprises of new energy vehicles will turn their talent supply to secondary schools. Therefore, in the teaching activities of new energy knowledge, the innovation of teaching concept through teaching methods can promote the long-term development of secondary schools.

Situational Status

Entering a new era, our government attaches great importance to vocational education and places it in a prominent position in economic and social development and education reform and innovation. More than 70% of students in vocational schools come from rural areas, and they play an important role in the fight against poverty and the building of a well-off society in all aspects in China. Vocational education shoulders the important task of cultivating diversified talents, passing on technical skills, and promoting employment and entrepreneurship, and has made outstanding contributions to supporting the transformation and upgrading of China's industrial structure, upgrading manufacturing and service industries, and safeguarding people's livelihood.

After a long period of practical exploration, China has formed a unique paradigm for the development of modern vocational education. Practice has proved that following the needs of economic and social development, serving industrial upgrading and promoting the integration of industry and education and school-enterprise cooperation are the driving force of high-quality development of vocational education; insisting on being rooted in the motherland, based on national conditions and serving regional industrial development is the deep soil for vocational education to enhance its adaptability; implementing the fundamental task of establishing moral education, cultivating high-quality talents with high moral and technical skills, using both hands and brains and developing for life is the key to improving the social contribution rate. The key to improve the social contribution rate and employment rate. Implementing the fundamental task of establishing moral education, cultivating high-quality technical and skilled talents with excellent moral and technical skills, using hands and brains, and

developing for life, promoting the effective connection of education chain, talent chain, industry chain and innovation chain, and promoting employment and entrepreneurship are the fundamental ways to improve social contribution and recognition.

China's economic and social development has strengthened exchanges and cooperation between industries and enterprises, and promoted the accelerated upgrading of domestic industrial structure. The change of industrial structure has brought new jobs and work contents to people, and the demand for all kinds of skilled talents in various industries is expanding. The upgrading of old industries and the emergence of new industries not only raise the requirements of industry enterprises for talents' skills, but also emphasize the innovative spirit of talents and pay more attention to students' literacy and all-round development, which means that vocational education courses face great challenges. At present, in the traditional vocational education curriculum, vocational schools are not yet equipped with the ability to adjust and upgrade their majors in response to industrial upgrading; vocational education curriculum emphasizes theory rather than practice; the curriculum developed by schools is out of touch with the times, and the students trained cannot fully adapt to the needs of industrial development in the new era. In this situation, the first thing vocational schools should do is to deepen the reform of vocational education curriculum, improve the accuracy and gold content of vocational education curriculum, and deeply integrate with practice in professional settings, curriculum support and talent training programs, so as to meet the needs of economic and social development for vocational education curriculum reform.

Our government has issued various documents on the integration of industry-education and school-enterprise cooperation as a way to emphasize the importance of the work on the integration of industry-education and school-enterprise cooperation in vocational education. In December 2017, the General Office of the State Council issued "Several Opinions on Deepening the Integration of Industry and Education", which put forward the institutional framework for deepening school-enterprise cooperation at the Chinese level for the first time; in February 2018, the Ministry of Education and six other departments issued "Vocational Education School-Enterprise Measures for Promoting Cooperation In February 2018, six departments, including the Ministry of Education, issued the Measures for Promoting School-Enterprise Cooperation in Vocational Education, providing policy protection for school-enterprise cooperation in vocational education. 2019, the State Council issued the National Implementation Plan for Vocational Education Reform, which mentions that "schools actively provide enterprises with the required curriculum, teachers and other resources, and enterprises should fulfill their obligations to implement vocational education in accordance with the law, using funds, technology, knowledge, facilities, equipment, management and other elements to participate in school-enterprise cooperation and promote human resource development." In 2022, the provinces issued the "Notice on the pilot work of fostering and building enterprises for the integration of production and education in 2022" for China to carry out the pilot work of fostering and building enterprises for the integration of production and education. The specific content and principle requirements of the scope of the pilot enterprises of integration of industry and education, the conditions of pilot enterprises, construction and cultivation, and support measures are clearly defined to provide institutional guarantee for promoting the construction and cultivation of enterprises of integration of industry and education and comprehensive revitalization. Appropriate education is the best education. Compared with general education, the integration of industry and education and school-enterprise cooperation is an inevitable trend in the development of vocational education and a necessary way to achieve a win-win situation for education and industry. The development trend of vocational education in the new period continues to be good, but there are some urgent problems of vocational education school-enterprise cooperation, which affect and restrict the further development of

vocational education school-enterprise cooperation. How to solve the policy implementation dilemma of vocational education school-enterprise cooperation under the framework of the policy system and explore the long-term mechanism of vocational education school-enterprise cooperation requires further deepening the content of school-enterprise cooperation, moving from school-enterprise cooperation to the integration of industry and education, promoting production with learning and bringing learning with production to achieve interaction. The promotion of a series of policies in China has made deepening the integration of industry and education and school-enterprise cooperation a key breakthrough direction for the reform of vocational education in China.

Research Methodology

The survey method is a combination of conversation and questionnaire to understand, analyze, synthesize, compare and summarize the information collected from the survey to provide regular understanding of the research method. This study intends to conduct a sample survey of secondary vocational schools by means of questionnaires and interviews, The research in this paper takes Hangzhou Modern School as a sample, starts from the development system, mechanism and current situation of school-enterprise cooperative curriculum development in Hangzhou Modern School, investigates, analyzes, organizes and summarizes, and analyzes the problems of school-enterprise cooperative curriculum development in secondary schools today through actual research on the current situation of school-enterprise cooperative curriculum development in Nanjing, analyzes the reasons for the problems, and then proposes targeted and operable specific research ideas are as follows. The specific research ideas.

The survey targets were selected from secondary teachers and secondary students in Nanjing J school, including teachers and students of automobile maintenance, marketing and tourism management majors. 65 questionnaires were sent to teachers and 62 were collected, with a 95% recovery rate; 242 questionnaires were sent to students and 211 were collected, with a 87% recovery rate. The main purpose of the interviews was to investigate the attitudes and understanding of school leaders and enterprises towards the development of school-enterprise cooperation courses.

Research Result

The survey data shows that 77% of the schools offer courses developed by school-enterprise cooperation, while 23% of the schools do not offer courses developed by school-enterprise cooperation; 98% of the teachers think the schools attach importance to school-enterprise cooperation course development, and only 2% think the schools do not attach importance to school-enterprise cooperation course development.

The survey data show that 62% of teachers think that the development of school-enterprise cooperation courses should be developed collectively, including school teachers and external experts, etc. 30% of teachers think that the school should develop a staff development team, and 8% of teachers think that inviting experts from external universities is the way to develop school-enterprise cooperation courses, among which no teachers think that it should be developed by teachers themselves. The reason may be due to the fact that most teachers think that curriculum development is not the responsibility of teachers, or they may think that they do not yet have the knowledge, experience and time and energy to fully develop the curriculum. Curriculum resources are important carriers and conditions for implementing school-enterprise cooperative curriculum, showing the characteristics of secondary education, and achieving the training objectives and. In the process of curriculum development, both schools and enterprises need to invest a lot of human and material

resources, especially the enterprises need to provide more resources. In the survey of teachers, 89% of them think that enterprises' input is not enough and hope to get relevant resources from enterprises in the future development of school-enterprise cooperative curriculum, which shows that the degree of enterprises' participation in the development of curriculum resources does not reach the school's expectation. On the one hand, the deep involvement of enterprise experts has an irreplaceable role in curriculum development, but the many internal affairs of enterprises make it difficult for enterprise experts to devote more energy and time to curriculum development, and the coordination of human resources becomes a problem. On the other hand, considering the strength of enterprises, some enterprises can hardly provide the excessive resources that secondary vocational colleges expect to obtain. The construction and sharing of resources such as the science and practical classrooms and training bases need a lot of capital from enterprises, which are important carriers for cultivating technical skills talents, but under the background of fierce competition in the market, enterprises will choose to invest more capital in their own construction and development rather than the development of curriculum resources. In addition, due to the reason of commercial secrets among enterprises, enterprises may have reservations about some production links and materials, the core information cannot be shared, the developed course content cannot be fully matched, and students cannot learn the course that is fully in line with the actual job, and the authenticity of the course is limited.

The school-enterprise cooperation mode can promote the smooth and efficient development of secondary school curriculum, but in reality, there are few enterprises cooperating with secondary schools, and there are only a few enterprises that can maintain long-term cooperation relationship with secondary schools. One of the main reasons is the lack of stable and long-term guarantee mechanism for the cooperation between schools and enterprises. Secondary schools have a positive attitude towards the cooperation between schools and enterprises in curriculum development, but they do not have a fully corresponding system and institution. There is no special organization to coordinate with them, so it is difficult for school teachers to communicate with enterprises unilaterally, and there is no way to communicate between school leaders and teachers, and they do not know how to solve the problems and excuse each other.

Conclusion and Discussion

The necessity to carry out innovation in middle-grade automotive new energy teaching is to meet the demand for talents in the field of new energy vehicles, and also to promote the long-term development of middle-grade schools. In the future, when innovating education methods in the teaching of new energy in secondary school, it should enrich the content of automobile professional teaching materials and teaching materials, build intelligent training rooms for new energy vehicles and independent inquiry type knowledge learning classrooms, and moreover, continuously optimize and improve the evaluation of teaching results to stimulate students' interest in knowledge learning and establish students' self-confidence in learning.

Secondary colleges and universities are an important part of China's current talent training system, and the development of educational activities in secondary colleges and universities plays a rather important role in cultivating professional and technical talents. At a time when the demand for professional and technical talents is expanding, secondary colleges and universities are required to shoulder their own responsibilities and promote the quality of talent cultivation through the improvement of their own teaching modes and methods so as to cultivate the talents needed for the development of society. For vocational training institutions such as secondary vocational colleges, they need to strictly track the market development when cultivating relevant professional and technical personnel, effectively grasp the talent needs of

each industry, and carry out personnel training activities accordingly, so as to cultivate professional and technical personnel to meet the needs of society.

The development of school-enterprise cooperation curriculum in secondary vocational schools. With the method of case study, the current situation, problems and causes of school-enterprise cooperation curriculum development in secondary vocational schools are investigated and analyzed, and on this basis, suggestions are made with examples, resulting in a more in-depth and practical research result. In terms of theoretical value, it illustrates the credibility of Dewey's theory of pragmatism, vocational education stakeholders and work process systematic curriculum development, in terms of practical value, it helps the development of school-enterprise cooperative curriculum development in secondary schools and lays the foundation for subsequent research. Compared with other studies, this study uses case study as the main method, which is more helpful to expand the influence of school-enterprise cooperative curriculum development. According to the case study, the research results are presented in terms of increasing the enthusiasm of enterprises to participate, establishing the correct concept, building the faculty, developing the curriculum resources and improving the guaranteed mechanism, which help to improve the understanding and attention of secondary schools and enterprises to the development of school-enterprise cooperative curriculum.

References

- Du, Y. H., & Ding, J. (2020). Study on the problems and countermeasures of College students' online course learning [J]. *Rural Economics and Science and Technology*, 31(10), 344-354.]
- Ma, Sanxi. (2019). Experience and Enlightenment of Ideological and Political Education Reform in the context of Educational information. *Chinese and Foreign Entrepreneurs*, (11), 164-165.
- Ministry of Education of the People's Republic of China. (2020). The organization and management of online teaching in colleges and universities should be done well during the epidemic period [EB /OL]. [2020-02-05]. [HTTP://WWW.MOE.Gov.cn/jyb_xwfb/gzdt_gzdt/s5987/202002/t20200205_418131.html](http://www.moe.gov.cn/jyb_xwfb/gzdt_gzdt/s5987/202002/t20200205_418131.html).
- Wu, F., Zhou, Z. Z., & Liu, Y. (2016). The American experience of government purchase of Services and its significance to China: Based on the observation of a case of public service. *Review of Public Administration*, 9(4), 4-22.