



An Empirical Study on the Benefit Correlation Analysis of School and Enterprise Cooperation in Higher Vocational Education

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Abstract. School and enterprise cooperation is the lifeline of vocational education. As early as 2010, the Outline of the National Program for Medium - and Long-term Education Reform and Development (2010-2020) emphasized that the development of higher vocational education must adopt the school-enterprise cooperation mode. In the new era, how to develop the characteristics of vocational education depends to a certain extent on the depth and breadth of cooperation between vocational schools and enterprises. By means of questionnaire survey, 74 vocational colleges and 231 secondary vocational schools in Shandong Province and 980 enterprises inside and outside the province were investigated. A questionnaire survey system based on SpringBoot is designed for the collection and management of questionnaire data. According to the data statistical analysis results of SPSS, the promotion measures were put forward from the perspective of the government, industry, schools and enterprises. The aim of this paper is to solve the problems of insufficient cooperation in school and enterprise cooperation, excessive pursuit of short term interests in school and enterprise cooperation, lack of motivation for enterprises to participate in the development of vocational education and the formation of effective models of school and enterprise cooperation.

Keywords: School and enterprise cooperation; Points of interest; Empirical research

1 Introduction

The report of the 19th National Congress also clearly stated that: "We should deepen the integration of industry and education, and cooperation between schools and enterprises". This is the general consensus of vocational education proved by many years of practice, which is the basic requirements of the country for vocational education ^[1].

According to the stakeholder theory, schools and enterprises are community of interests. As an indispensable learning place in the field of vocational education, the connotation of educational institutions has been extended from the traditional pure school

form to no school form of enterprises. But colleges take education as the primary goal and pursue social benefits, enterprises take profit as the first goal. The interests of the two sides aren't completely equal. Based on this, this study conduct data analysis based on the relevant points of school and enterprise cooperation, explore the key points that restrict the development bottleneck of school and enterprise cooperation, seek common interests of the university and enterprise. By finding out the difference of interests in school and enterprise cooperation and clarifying the cooperation path in school and enterprise cooperation, it is beneficial to build the common destiny of school and enterprise, further promote the development of schools and improve the competitiveness of enterprises. And further promote the regional economic development to provide more intellectual support and talent security.

2 Research design

2.1 Research framework

The research adopts the empirical research method to explore the points of interest, and the research framework is as follows.

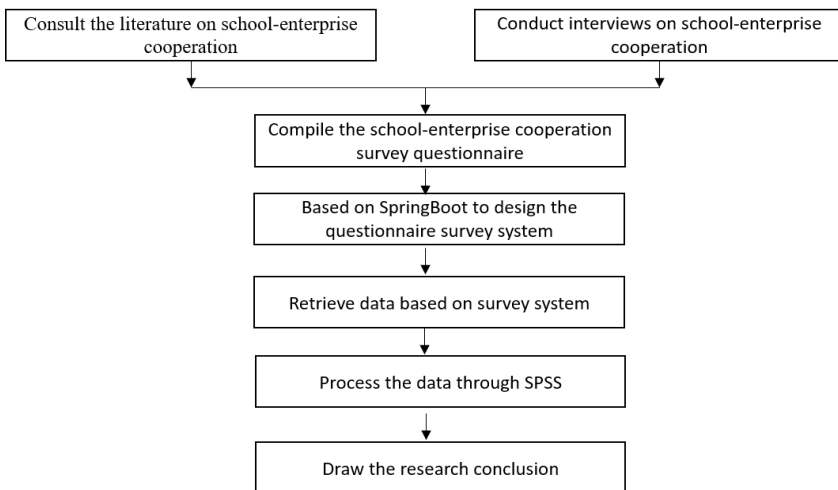


Fig. 1. Research Framework [Draw by myself]

2.2 Research objects

A large sample questionnaire survey was conducted in 74 vocational colleges and 231 secondary vocational schools in Shandong Province and 980 enterprises inside and outside the province. A total of 1940 questionnaires were collected, with an effective rate of 94.02%. There were 1307 questionnaires in the enterprise version, with an effective rate of 86.46%.

2.3 Research tools

The author design "the Shandong province vocational school enterprise cooperation questionnaire ", and invite supervisor of the author's school in charge of enterprise cooperation management to evaluate the questionnaire. Finally, 14 items remain, which are the main content of school and enterprise cooperation. The Cronbach reliability coefficient was 0.935. As can be seen from Fig.2, deleting any item of the questionnaire will reduce the reliability of the questionnaire.



Fig. 2. Item-Total Statistics [Draw by myself]

Note: Data source: 74 vocational colleges and 231 secondary vocational schools in Shandong Province and 980 enterprises inside and outside the province

2.4 The system design

In order to facilitate the collection and management of questionnaires, a questionnaire survey system is designed. The system is developed separately from the front end, with VUE framework in the front end and SpringBoot framework in the back end. MySQL database is used to store data, and Ajax is used in the front and back end to asynchronously refresh data. The system integrates questionnaire design, questionnaire release and questionnaire answer, which effectively reduces labor costs and improves work efficiency. This system is divided into three functional subsystems: questionnaire management, answer sheet subsystem and answer sheet statistics subsystem.

3 Research results

Both the university and the enterprise scored the 14 items of "degree of willingness to cooperate" respectively. Conduct independent sample T test to explore whether there

was any difference in degree of willingness to cooperate with the university and the enterprise. See Fig 3 and Table 1 for statistical data.

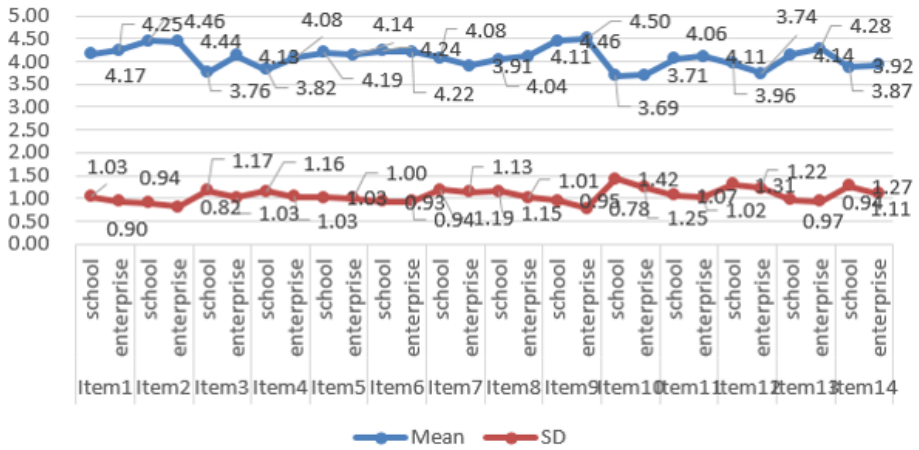


Fig. 3. Mean and variance descriptive statistics [Draw by myself]

Note: Data source: 74 vocational colleges and 231 secondary vocational schools in Shandong Province and 980 enterprises inside and outside the province

3.1 Cooperation projects with insignificant differences in school and enterprise cooperation willingness

Providing students with on the job internship opportunities ($t=0.76, p=0.447$), teachers with on the job training opportunities ($t=1.282, p=0.200$), carrying out staff training ($t=0.514, p=0.608$), providing schools with part time teachers ($t=-1.914, p=0.056$), providing students with employment opportunities ($t=-1.169, p=0.242$), providing education and training funds to the school ($t=-0.432, p=0.666$), providing training and lectures to the school ($t=-1.185, p=0.236$), providing student scholarships or bursaries ($t=-1.176, p=0.240$) and so on. That is to say, in the above eight aspects, there is no significant difference in the willingness of school and enterprise cooperation.

3.2 Cooperation projects in which the school is less willing to cooperate than the enterprise

In terms of participation in the design and implementation of talent training programs, there are significant differences in the willingness of school and enterprise cooperation ($t=-2.070, p<0.05$), $M(\text{school})=4.17 < M(\text{enterprise}) = 4.25$, indicating that the willingness of schools to expect enterprises to participate in the design and implementation of talent training programs is significantly lower than that of enterprises.

In terms of joint scientific and technological research and solving technical problems, there are significant differences in the willingness of school and enterprise cooperation ($t=-8.874$, $p<0.001$), $M(\text{school})=3.76<M(\text{enterprise})=4.13$, indicating that the willingness of schools to solve technical problems through joint scientific research is significantly lower than that of enterprises.

In terms of cohosting research projects, there are significant differences in the willingness of school and enterprise cooperation ($t=-6.167$, $p<0.001$), $M(\text{school})=3.82<M(\text{enterprise})=4.08$, indicating that the degree of willingness of the university to cohost the research work of scientific research projects is significantly lower than that of the enterprise.

In the aspect of school and enterprise cultural exchange, there are significant differences in the willingness of school and enterprise cooperation ($t=-3.719$, $p<0.001$), $M(\text{school})=4.14<M(\text{enterprise})=4.28$, indicating that willingness of schools to carry out school and enterprise cultural exchanges is significantly lower than enterprises.

3.3 Cooperation projects in which the school is more willing to cooperate than the enterprise

In terms of providing practical training equipment and facilities for schools, there are significant differences in the willingness of school and enterprise cooperation ($t=3.688$, $p<0.001$), $M(\text{school})=4.08>M(\text{enterprise})=3.91$, indicating that the willingness of schools to provide practical training equipment and facilities is significantly higher than that of enterprises.

In terms of the establishment of productive training workshops in schools, there are significant differences in the willingness of school and enterprise cooperation ($t=4.334$, $p<0.001$), $M(\text{school})=3.96>M(\text{enterprise})=3.74$, indicating that the willingness of schools to build productive training workshops is significantly higher than that of enterprises.

Table 1. Comparison of school and enterprise differences in cooperation projects [Draw by myself]

Num	Items	F Value	T Value
1	Participation in the design and implementation of talent training programs	13.584***	-2.070*
2	Providing students with on the job internship opportunities	3.618	0.760
3	Joint scientific and technological research and solving technical problems	44.104***	-8.874***
4	Cohosting research projects	43.344***	-6.167***
5		2.895	1.282

	Teachers with on the job training opportunities		
6	Carrying out staff training	0.052	0.514
7	Providing practical training equipment and facilities for schools	5.308*	3.688***
8	Providing schools with part time teachers	24.940***	-1.914
9	Providing students with employment opportunities	19.594***	-1.169
10	Providing education and training funds to the school	49.654***	-0.432
11	Providing training and lectures to the school	3.455	-1.185
12	Establishment of productive training workshops in schools	3.241	4.334***
13	School and enterprise cultural exchange	3.765	-3.719***
14	Providing student scholarships or bursaries	42.134***	-1.176

Note: Data source: 74 vocational colleges and 231 secondary vocational schools in Shandong Province and 980 enterprises inside and outside the province

4 Discussion

4.1 The school and enterprise cooperation isn't deep enough

The Measures for Promoting School and Enterprise Cooperation in Vocational Schools issued by the Ministry of Education and other six departments mentioned that "the situation of school and enterprise cooperation carried out by enterprises should be included in the corporate social responsibility report". Enterprises have the responsibility to participate in school and enterprise cooperation. However, in reality, enterprises do participate in school and enterprise cooperation, but the problems of school and enterprise cooperation without deep integration and integration still exist, and some school and enterprise cooperation is shallow and loose^[2]. Enterprises' participation in vocational education is easy to be superficial, and there is a phenomenon of impetuous and eager for quick success and instant benefits^[3].

4.2 Schools excessively pursue short term benefits in school and enterprise cooperation

According to the research results, in terms of the willingness to participate in the design and implementation of talent training programs, to jointly tackle key problems in science and technology, to jointly host scientific research projects and to carry out school and enterprise cultural exchanges, the willingness of schools is far lower than that of enterprises. However, in the process of development, enterprises often encounter bottlenecks in scientific research and technology, which makes the road of development narrower and narrower. As an important place for scientific research, schools have unique advantages in intelligence and talent^[4]. However, some schools are more keen to enterprise's capital and investment of equipment, that's mean they are concern short term economic benefits. At the same time, the school teachers don't have more time and energy to enterprise survey, unable to make the plan together, united technologies research and deep cultural exchanges. In addition, vocational college teachers can't provide the talents and technologies required by enterprises in the industry.

4.3 The principal role of enterprises hasn't been fully brought into play

For a long time, there are interest points such as economic interests, social interests, policy interests and cultural interests in school and enterprise cooperation, but there are some phenomena such as ambiguous intersection of interests and unequal interests between vocational colleges and enterprises cooperation^[5]. Through the research results, it is found that the willingness of enterprises to provide practical training equipment and facilities and productive training workshops for schools is far from the requirements of schools. Enterprises' concerns about students' lack of experience, limited ability to return to enterprises, prominent contradictions in engineering^[6], lead to the lack of motivation for enterprises to participate in the development of vocational education.

5 Conclusions

5.1 The government promotes and gives play to the government's macro control role

5.1.1 Construct National Qualifications Framework.

National qualification framework should be constructed to integrate various types of education and training, including school education and no school education, formal learning and informal learning, adult education and vocational training, establish a credit bank system, and further promote the pilot work of the 1+X certificate system. To construct a lifelong learning system in which learning outcomes can be recognized, accumulated and transformed. When building the qualification framework, the demands of stakeholders should be fully considered, which is conducive to mobilizing the enthusiasm of stakeholders to participate in vocational education^[7].

5.1.2 Strengthen the cultural environment for enterprises to undertake the responsibility of vocational education

Work with relevant departments to study the additional reduction and exemption policies of enterprise education fees for setting up vocational education, strengthen policy incentives and guidance, adopt tax reduction and preferential treatment, compensate and reduce the cost of enterprise participation, and promote the reasonable flow and effective allocation of talents resources of schools and enterprises [8]. We will continue to improve the incentive mechanism, explore more ways for social forces to participate in vocational education, and stimulate the endogenous motivation for industrial enterprises to participate in vocational education.

5.2 Industry Association make guidance, and give play to the bridge role of trade associations

5.2.1 Build an information platform for school and enterprise cooperation.

The industry association builds a school and enterprise cooperation information platform for vocational education with the participation of the government, industry, enterprises and schools, guides all kinds of subjects to participate in the development of the platform, and realizes information sharing. Based on the industrial development, regional economy, regularly publish school and enterprise cooperation related information and skilled talents supply and demand information, particularly for the industry to the forefront of the industry development at home and abroad information, enhance the level of internationalization of vocational education, on the development of vocational education with the industry at home and abroad enterprises demand [9].

5.2.2 Strengthen the guiding role of the industry association

Regularly carry out government, industry, enterprise and school to participate in the activities of dialogue, build the business and the school fosters the talent, the mechanism of effective docking will industry enterprise needs to school, to absorb industry enterprise experts to assist vocational schools to establish in depth cooperative relations with relevant enterprises. Promote the reform of education and teaching in vocational colleges, especially the construction of vocational education groups and the pilot work of modern apprenticeship system.

5.3 Give play to the backbone role of enterprises

5.3.1 Raise awareness of participation in vocational education.

Encourage enterprises make the medium and long term planning including school and enterprise cooperation. Enterprises with corresponding industry qualifications, which can provide corresponding professional guidance personnel, practical training equipment, vocational standards, curriculum content or other educational and teaching resources, shall take the initiative to cooperate with vocational schools.

5.3.2 Get deeply involved in vocational education.

To organize or participate in vocational education through sole proprietorship, joint venture, cooperation and other forms, and to transform public vocational schools with insufficient education vitality through purchasing, renting, entrusted management and other ways. The establishment of a mixed ownership college, both the school and the enterprise participate in the running of the school by means of capital, knowledge, technology, management, facilities, equipment and other ways to hold shares and rights. The shareholding parties shall distribute dividends according to a certain proportion to ensure the benefits of the industrial parties to participate in the running of the school, so as to truly mobilize the enthusiasm of industrial enterprises to participate in the school.

5.4 The principal role of the school shall be brought into play

5.4.1 Actively promote the reform of "teachers, teaching methods, teaching materials " in vocational education.

Build a structured and high level teaching team with a reasonable structure and a combination of specialized and part time teaching. The provision of technical consultation and training services by teachers for industrial enterprises shall be regarded as important indicators of professional title evaluation. Schools and enterprises jointly compile new teaching materials. To carry out the "class revolution", explore the mode of financing by documentary evidence the certificate training content into the talent training scheme, optimize the curriculum and teaching content. In the internal system, establishing internal quality assurance system. From the external system, the third party should be actively introduced to strengthen the evaluation of teaching quality.

5.4.2 Open up channels for enterprises to participate in vocational education

The school establishes a board of directors or board of directors system with the participation of multiple subjects, such as industrial enterprises and schools, to optimize internal governance and discuss major issues of the school. In the process of training students and employees, enterprises should be given a say in the whole process of what kind of people to train and how to train them. We will strengthen the rational flow of human resources between vocational colleges and enterprises, and encourage enterprises to employ high skilled people as part time teachers in vocational colleges. Teachers of vocational colleges, technical and managerial personnel of enterprises who take part time jobs in enterprises or schools shall determine their salaries by agreement on their own.

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