

Exploration and Practice of Collaborative Curriculum Development between Universities and Enterprises Based on Industrial Associations

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Abstract: The purpose of this paper is to discuss how to carry out curriculum construction based on industrial association, so as to improve the practicability, adaptability and employment competitiveness of vocational education. Through theoretical analysis and practical case analysis, this paper discusses the advantages and characteristics of school-enterprise cooperation and industrial association cooperation, and puts forward suggestions on strengthening cooperation mode and mechanism innovation, hoping to provide certain reference for the development of vocational education.

Keywords: Vocational Education; Industry Association; Curriculum Construction; School-enterprise Cooperation.

1. Introduction

Curriculum construction plays a vital role in higher education, which directly affects the learning effect of students and the employment competitiveness of graduates [1]. As an emerging model, the curriculum construction aims to strengthen the connection between higher education and industry, and improve the employment competitiveness and adaptability of graduates [2]. However, there are still many problems in this model that need to be further explored and improved. As a representative of the industry, the industry association has rich industry resources and practical experience, which can provide important support and guidance for the school-enterprise cooperation to carry out the curriculum construction [3].

2. Theoretical Analysis

The quality and effectiveness of curriculum construction are directly related to the learning effect of students and the employment competitiveness of graduates. University-enterprise collaboration in curriculum construction aims to strengthen the link between higher education and industry and improve the employment competitiveness and adaptability of graduates. However, there are a series of problems in the current curriculum construction [4], which constrain its effectiveness and efficiency, mainly in the following aspects:

First of all, the courses offered by some schools are detached from the actual industrial needs, the content is too theoretical and out of touch with the actual job requirements of enterprises, resulting in insufficient competitiveness of graduates in employment. The root cause is that some colleges and universities lack an accurate grasp of industry development trends and market demand, and are unable to adjust the course content and teaching methods in a timely manner.

Secondly, some schools lack industrial orientation in their curriculum and teaching methods, failing to adjust course content and teaching methods in time to meet the rapidly changing market demand, which affects the quality of teaching and the employability of graduates. This indicates

that universities need to be more flexible and open in curriculum design and teaching methods, focusing on close interface with industry to meet the actual needs of the market.

In addition, the single mode of cooperation between some schools and enterprises and the lack of in-depth cooperation and long-term planning have led to unequal interests between the two sides and prevented the formation of positive interaction and sustainable development. This requires universities and enterprises to innovate in the mode of cooperation, establish a long-term and stable cooperative relationship, and jointly promote the in-depth development of curriculum construction.

Finally, teachers in some schools lack practical experience and industry background, and are unable to keep abreast of the latest industry dynamics and needs, which affects the curriculum design and teaching effect. This shows that there are still some shortcomings in the construction of faculty in colleges and universities, and it is necessary to further strengthen the training and learning of teachers to improve their practical ability and professional level.

To summarize, the current curriculum construction is facing many challenges and problems, and it is necessary to continuously improve and refine the existing cooperation mode and mechanism through deepening theoretical research and practical exploration, so as to adapt to the fast-changing social needs and industry development. Therefore, the promotion of school-enterprise cooperation has its full necessity, aiming to better meet the social demand for talents and improve the practicality, adaptability and employment competitiveness of vocational education.

(1) Practice-oriented needs: One of the core objectives of vocational education is to cultivate students' practical skills and problem-solving abilities. And school-enterprise cooperation can let students get in touch with the real working environment and business processes, and improve their professional skills through practical learning, so as to better adapt to the needs of the job market.

(2) Employment-oriented requirements: The ultimate goal of vocational education is to help students find employment successfully. Through cooperation with enterprises, schools can more accurately understand the market demand and

industry trends, adjust the curriculum and teaching content, cultivate applied talents in line with the market demand, and improve the employment competitiveness of students.

(3) Advantage of resource sharing: Schools and enterprises have their own resources and complementary advantages, and through cooperation, they can realize resource sharing and complementary advantages, and improve the quality and effectiveness of teaching. Enterprises provide practice bases, advanced equipment and technical support, and schools provide teaching resources and professional knowledge to jointly cultivate talents.

(4) Requirements for the integration of industry, academia and research: School-enterprise cooperation helps to realize the integration of industry, academia and research, and promotes the transformation and application of scientific research results. By cooperating with enterprises in scientific research projects, schools can better transform scientific research achievements into actual products and services, and promote industrial upgrading and innovative development.

In this process, industry associations, as important organizations of the industry, play a crucial role, and their role and status are mainly reflected in the following aspects:

(1) Vocational and market-oriented: Industry associations have an in-depth understanding of industry development trends and enterprise needs, and can provide vocational and market-oriented guidance for vocational education. Through cooperation with industry associations, vocational colleges and universities can more accurately grasp the development of the industry, adjust the content and direction of teaching, and ensure that education and training are closely aligned with market demand.

(2) Formulation of standards for personnel training: Industry associations usually participate in the formulation and revision of standards for personnel training, clarifying the competency and skill requirements for various types of occupational positions in the light of industry needs and technological development trends. Vocational colleges and universities can base their curricula and teaching arrangements on these standards to ensure that students are able to perform practical work after graduation.

(3) Practical teaching resources support: Industry associations usually have abundant industry resources and practical teaching opportunities, which can provide practical teaching resources support for vocational colleges. Through cooperation with industry associations, vocational colleges and universities can carry out teaching activities that are highly practical and closely integrated with the industry, and enhance students' practical operation and problem-solving abilities.

(4) Employment guidance and career development support: Industry associations have certain resources and influence in employment guidance and career development, and can provide employment guidance and career development support for students of vocational institutions. Through cooperation with industry associations, vocational colleges can provide students with more employment opportunities and career development channels, and promote the smooth employment and career development of graduates.

In summary, compared with separate enterprise cooperation, industry associations have an important role and status in vocational education, and their ability to deeply understand industry demand and market dynamics, as well as rich industry resources and practical teaching opportunities, provide valuable support and help for vocational colleges and

universities, promote the deep integration of vocational education and industry, and provide a strong guarantee for talent cultivation.

When industry associations are involved in school-enterprise collaboration for curriculum development, the following paths and methods can be adopted:

(1) Demand research and analysis: Establish an industry research team, responsible for gaining an in-depth understanding of industry development trends, technology updates and enterprise demand characteristics, and formulating a detailed research plan. Through expert interviews, enterprise symposiums, online surveys, etc., collect demand information within the industry and enterprises, analyze the data, and refine the direction of key course construction.

(2) Formulate the curriculum construction program: set up a working group for curriculum construction, with the participation of on-campus teachers, enterprise representatives and industry experts, to formulate the overall program and specific implementation plan for curriculum construction. Holding working meetings, organizing thematic seminars, and carrying out a series of seminars to promote communication and exchange between the school and enterprises, to form a consensus, and to combine the results of the research to formulate the curriculum construction program.

(3) Provide support from industry experts: establish an expert advisory committee or an expert pool, including senior experts in the industry and technical backbones of enterprises, to provide professional guidance and technical support for curriculum construction. Invite experts to participate in curriculum design, textbook preparation, teaching evaluation, etc., and organize expert symposiums and special lectures to exchange the latest technology and industry development trends.

(4) Practical teaching resources support: establish close cooperative relationships with enterprises, jointly build practice bases, provide modern practical training facilities and equipment, and provide students with high-quality practical teaching resources. Signing cooperation agreements, determining the mode and content of cooperation, jointly investing in the construction of practice bases, carrying out practice teaching projects, and organizing activities such as enterprise internship job fairs.

(5) Regular assessment and adjustment: Establishing a mechanism for curriculum assessment and improvement, assessing and monitoring the curriculum on a regular basis, collecting feedback from students and enterprises, and making timely adjustments to the curriculum content and teaching methods. Evaluation activities such as student satisfaction surveys and graduate tracking surveys are carried out, and school-enterprise symposiums are organized to listen to the evaluations and suggestions of enterprises on graduates, so as to adjust the curriculum and teaching content according to the evaluation results.

Through the implementation of the above programs, paths and methods, industry associations can form a close school-enterprise cooperation mechanism with colleges and universities to jointly promote the work of curriculum construction, realize win-win cooperation between schools and enterprises, and provide a strong guarantee for talent cultivation. The cooperation between schools and enterprises combines the curriculum with the actual demand and improves the practicality and adaptability of the curriculum.

Overall, school-enterprise collaboration in curriculum construction is a difficult and important task that requires the joint efforts of schools, enterprises and industrial associations to form a synergy in order to promote the integration and development of higher education and industry.

3. Practical Case Study - Wenzhou Polytechnic and Regional Pillar Industry Associations Collaborate on Curriculum Teaching Innovation

Wenzhou is a typical manufacturing city, the electrical industry is a pillar industry in Wenzhou, the school is adjacent to Wenzhou Yueqing Electrical Industry Base, Yueqing is a national electrical industry base, the annual output value of more than 180 billion yuan, one of the country's 25 national advanced manufacturing clusters, with a number of domestic and foreign well-known industry leading enterprises such as Astronergy, Dexerity, People's Electrical Appliances and so on, has become the largest domestic low-voltage electrical industry, the number of companies It has become the industrial cluster with the largest scale, the largest number of enterprises and the most complete industrial chain support in China's low-voltage electrical industry.

Through the pairing ceremony with Yueqing Industrial Electrical Engineers Association, 16 teachers and nearly 50 engineers of the association were formally paired around the teaching and construction of 12 professional courses, such as Power Supply and Distribution Technology, Industrial Robotics Fundamentals, and Automatic Inspection Technology, etc. Excellent enterprise engineers selected from the association will serve as part-time teachers for the courses, and the enterprise engineers will participate in the teaching of the courses. They will also focus on assisting full-time teachers to improve the teaching innovation ability of the courses, such as taking full-time teachers on field visits, operating the production equipment on the front line of the enterprises, showing teachers the new technologies, new techniques and new methods of production management on the front line of the enterprises, analyzing the new requirements of the enterprises on the quality, knowledge and skills of the employees for the teachers, and providing the relevant cases. Through the above ways, the enterprise engineers will collaborate with and help the teachers to improve and develop the teaching methods. Through the above ways, the enterprise engineers cooperate and help our teachers to improve and develop the teaching standards, teaching resources, teaching methods and teaching evaluation standards that incorporate the advanced elements and development needs of the industry, and cooperate to carry out the innovation of the teaching of the courses.

Prior to this, the team has established an industry-teaching alliance with Zhejiang Electrical Industry Association and the Administrative Committee of Yueqing Economic Development Zone to implement the industry-teaching cooperation projects. Since 2019, the Electrical Industry Association has sent 10 chief engineer-level visiting professors of leading electrical enterprises and nearly 30 part-time teachers of excellent engineers of well-known electrical enterprises in the regulation to this specialty, which helps this specialty to build a high level of part-time teacher construction team of the enterprise, participate in the Participate in the design and development of professional courses, participate in the teaching of more than 20 courses,

the Association of more than 1,400 engineers to learn the professional courses online. In addition, the school-enterprise cooperation has developed more than 10 teaching materials, 5 provincial new form teaching materials, 2 national regulation teaching materials, more than 50 typical real application teaching projects of enterprises, and more than 60 graduation design projects under the guidance of the school-enterprise cooperation.

4. Conclusion

School-enterprise cooperation and cooperation with industrial associations play an irreplaceable role in school-enterprise collaboration in curriculum construction, which are complementary and mutually reinforcing, and jointly promote the deep integration of higher education and industry. In order to further strengthen university-enterprise cooperation in curriculum construction and improve its effectiveness and efficiency, the following suggestions are put forward:

(1) Strengthening of school-enterprise cooperation mechanisms

Establishing a multi-level and multi-field school-enterprise cooperation mechanism to promote the depth and breadth of cooperation.

Establishing a sound curriculum assessment mechanism to make timely adjustments to curriculum content and teaching methods.

(2) Strengthening the participation and support of industry associations

Establish a long-term cooperation mechanism between industry associations and universities to form a good relationship.

Give full play to the industry resources and professional advantages of industry associations to provide support and guidance for the curriculum construction of universities.

(3) Upgrading the professionalism of the teaching staff

Strengthening the training and learning of teachers to enhance their industry background and practical experience.

To establish an exchange mechanism between teachers and employees of enterprises to promote mutual growth and learning.

Acknowledgments

This work was supported by a grant WZYBSZD202103 from Wenzhou Polytechnic.

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