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# Research on the talent cultivation model of school enterprise collaboration based on engineering education

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***Abstract:*** *This article studies the talent cultivation model of school enterprise collaboration based on engineering education. By analyzing the challenges faced by current engineering education and their solutions, it explores the importance and implementation methods of school enterprise cooperation in engineering education. The research results indicate that school enterprise collaboration can effectively enhance students' practical abilities and employment competitiveness, promote the development of higher education quality and enterprise technological innovation.*

***Keywords:*** *engineering education; Talent cultivation through school enterprise collaboration; reform in education*

## 1. Introduction

Engineering education, as an important way to cultivate engineering and technical talents, its teaching quality and talent cultivation mode directly affect the quality and level of engineering talents. The traditional education model for cultivating efficient engineering talents often emphasizes theory over practice, which makes it difficult for graduates to quickly adapt to the needs of enterprises in practical work. In order to solve this problem, the talent training model of school enterprise collaboration has emerged. This article will discuss the specific implementation and effect of this model from many aspects [1].

## 2. The background of the talent cultivation model of school enterprise collaboration

### *2.1 The challenges faced by engineering education*

(1) The disconnect between theory and practice

①The proportion of theoretical teaching is too high

In the current engineering education system, theoretical teaching often occupies a dominant position, resulting in students who have a solid theoretical foundation but appear powerless when facing practical problems [2]. This teaching model that emphasizes theory over practice neglects the practicality and applicability of engineering disciplines, making it difficult for students to quickly adapt to the demands of their job positions after leaving school. The imparting of theoretical knowledge is certainly important, but without the combination with practical operation, it is difficult to cultivate compound talents who understand both theory and practice.

②Insufficient experimental courses and practical opportunities

Experimental courses and practical activities serve as a bridge between theory and practice, but many universities currently have significant shortcomings in this regard. The problems of outdated experimental equipment, outdated experimental content, and lack of practical bases seriously limit the cultivation of students' practical abilities [3]. In addition, off campus internship opportunities are also limited, and many students can only accumulate experience through simulation projects or simple on campus training, which far cannot meet the demand of enterprises for talents with practical experience.

(2) Rapid changes in market demand

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①Fast technological updates

With the rapid development of technology, new technologies and processes emerge one after another, and the speed of technological updates in the engineering field continues to accelerate [4]. However, the teaching content and curriculum of universities often cannot keep up with these changes, resulting in a deviation between the knowledge learned by students and the actual needs of enterprises. In order to address this challenge, universities need to strengthen cooperation with enterprises, timely understand industry trends and technological developments, adjust teaching content and curriculum settings, and ensure that what students learn is in line with market demand [5].

②Diversified enterprise needs

The demand for talent varies among different industries and enterprises. The traditional engineering education model often focuses on cultivating students' professional skills and basic knowledge, while neglecting the cultivation of students' comprehensive qualities and innovative abilities [6]. However, in modern enterprises, in addition to professional skills, comprehensive qualities such as communication skills, teamwork skills, innovative thinking, and problem-solving abilities are equally important. Therefore, universities need to adjust their talent cultivation models, focusing on cultivating students' comprehensive qualities and innovative abilities to meet the diverse needs of enterprises.

(3) Intense employment competition

①An increase in the number of graduates

With the popularization of higher education and the implementation of enrollment expansion policies, the number of college graduates has been increasing year by year. This has made the job market increasingly competitive, and many graduates are facing the problem of "difficult employment". In order to enhance the employment competitiveness of graduates, universities need to strengthen cooperation with enterprises, jointly carry out employment guidance and service work, help students understand market demand and employment prospects, and improve job seeking skills and professional ethics [7].

②Lack of practical experience

Practical experience is a crucial aspect that enterprises place great emphasis on during the recruitment process. However, due to various reasons such as insufficient experimental courses and practical opportunities, limited opportunities for off campus internships, etc., many graduates lack practical experience when seeking employment [8]. This makes it difficult for them to stand out during the interview process and also increases their employment difficulty. To solve this problem, universities need to strengthen cooperation with enterprises, provide more practical opportunities and internship positions for students, and enable them to accumulate experience and improve their abilities through practice.

(4) Teaching methods and patterns lag behind

①Single teaching method

Traditional engineering education methods often focus on lectures and lack interactivity and participation [9]. This single teaching method is difficult to stimulate students' interest and enthusiasm for learning, and it is also not conducive to cultivating students' innovative thinking and critical thinking abilities. In order to change this situation, universities need to explore diverse teaching methods (such as case-based teaching, project-based teaching, flipped classroom, etc.), improve classroom interactivity and participation, and stimulate students' learning interest and creativity [10].

②Insufficient innovation in teaching modes

Faced with rapidly changing market demands and diverse business needs, universities need to constantly innovate their teaching models to adapt to these changes. However, many universities currently have shortcomings in innovative teaching models and still use traditional teaching models and curriculum systems. In order to improve the quality and effectiveness of teaching, universities need to strengthen cooperation and communication with enterprises, and jointly explore teaching models and curriculum systems that meet market and enterprise needs [11]. At the same time, it is necessary to actively introduce advanced teaching technologies and methods (such as virtual reality technology, online learning platforms, etc.) to provide students with a more convenient and efficient learning experience.

(5) Insufficient depth of school enterprise cooperation

①Single form of cooperation

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Currently, many universities and enterprises have a relatively single form of cooperation, mainly through the construction of internship bases and joint talent training. Although this form of cooperation can provide students with certain practical opportunities and employment channels, it is difficult to form a situation of deep cooperation. In order to deepen school enterprise cooperation, universities need to explore more diverse forms of cooperation (such as co building research and development centers, jointly applying for scientific research projects, etc.), and strengthen cooperation and exchanges between the two sides in scientific research, teaching, talent cultivation, and other aspects [12].

②Insufficient interaction between both parties

In the process of school enterprise cooperation, the interaction and communication between both parties are often insufficient. This makes it difficult for universities to accurately grasp the actual needs and market dynamics of enterprises in the process of talent cultivation; However, it is also difficult for enterprises to fully leverage their advantages and roles in the process of participating in talent cultivation [13]. In order to strengthen interaction and communication between both parties, universities need to establish regular communication mechanisms and information sharing platforms; At the same time, it is necessary to strengthen the training and education of students and teachers, and improve their cooperation awareness and ability level. Only in this way can we achieve deep cooperation and win-win development between schools and enterprises.

### *2.2 The advantages of school enterprise linkage*

The school enterprise linkage talent cultivation model refers to an educational model in which schools and enterprises establish a close cooperative relationship and jointly participate in talent cultivation [14]. As a new type of talent cultivation model, it has significant advantages in the field of engineering education, which can effectively address various challenges in traditional engineering education, promote the improvement of students' comprehensive quality, and enhance their employment competitiveness.

①Enhance practical skills

The school enterprise linkage model closely integrates school education with enterprise practice, providing students with rich practical opportunities and practical operation scenarios. This model enables students to apply their knowledge in a real work environment, exercise their hands-on and problem-solving abilities, and effectively compensate for the disconnect between theory and practice in traditional engineering education.

②Enhancing employment competitiveness

Through deep cooperation with enterprises, students can better understand market demand and industry trends, master advanced engineering technology and management methods. This not only enhances the employment competitiveness of graduates, but also enables them to adapt more quickly to the requirements of job positions, creating greater value for enterprises.

③Promote teaching reform and curriculum optimization

The school enterprise linkage model has promoted the updating of teaching content and the reform of teaching methods in universities. Through communication and cooperation with enterprises, universities can adjust and optimize their curriculum according to market demand, increase practical courses and project implementation courses, and better cultivate students' comprehensive abilities and innovative spirit.

④Enhancing research and innovation capabilities

School enterprise collaboration is not limited to the teaching process, but can also promote cooperation in scientific research and innovation. Collaborating research projects between universities and enterprises can not only accelerate the transformation and application of scientific research achievements, but also cultivate students' research abilities and innovative thinking, providing strong support for the combination of academia and industry.

⑤Strengthen communication and cooperation between teachers and business experts

The school enterprise linkage model provides a platform for communication and cooperation between teachers and enterprise experts. Teachers can better understand industry development trends and technological frontiers through cooperation with business experts, thereby updating their teaching content and methods, and improving teaching quality and effectiveness.

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## 3. The Implementation Approach of School Enterprise Linkage Model

In order to fully leverage the advantages of school enterprise collaboration, improve the quality of engineering education and the effectiveness of talent cultivation, multiple effective implementation methods must be adopted to ensure that cooperation between universities and enterprises can deepen and continue.

### *3.1 Building a cooperation mechanism*

①Establish a normalized cooperation platform

It is crucial to establish a normalized cooperation platform to ensure the continuity and stability of school enterprise cooperation. This platform can be physical, such as a co built industry university research cooperation center or innovation laboratory, or virtual, such as an online cooperation management system or information sharing platform [15]. Through these platforms, both schools and enterprises can regularly exchange information, share resources, coordinate cooperation matters, and ensure the smooth progress of cooperation projects. At the same time, the platform can also provide opportunities for both parties to showcase their achievements and meet their needs, further deepening their cooperative relationship.

②Sign a cooperation agreement

The cooperation agreement is the foundation and guarantee for the cooperation between schools and enterprises. The agreement should clearly define the key elements of cooperation goals, content, methods, deadlines, and respective rights and obligations of both parties. By signing a formal cooperation agreement, not only can the cooperation behavior of both parties be standardized, disputes and misunderstandings during the cooperation process be reduced, but legal protection can also be provided for both parties to ensure the smooth implementation of the cooperation project. In addition, the cooperation agreement can enhance the sense of responsibility and trust between both parties, laying a solid foundation for future in-depth cooperation.

### *3.2 Co developing courses*

①Establishing school enterprise cooperation courses

School enterprise cooperation courses are an important way to integrate the actual needs of enterprises into the teaching content of universities. By closely collaborating with enterprises and jointly developing courses that meet market demand and enterprise standards, students can gain an early understanding of industry trends, master practical skills, and enhance their competitiveness in employment [16]. These courses can be designed around the core business, technical challenges, or market demands of the enterprise, using interactive teaching methods such as case studies and project-based teaching to enhance students' practical and innovative abilities.

②Carry out dual teacher teaching

Dual teacher teaching refers to a teaching model in which university teachers and enterprise experts jointly undertake teaching tasks. By introducing enterprise experts into the classroom, students can be provided with the latest industry information and practical experience; At the same time, university teachers can also learn practical teaching methods and skills from enterprise experts. This teaching model can not only improve the quality and effectiveness of teaching, but also promote in-depth communication and cooperation between schools and enterprises. In order to implement dual teacher teaching, universities can establish a database of enterprise experts and invite enterprise experts with rich practical experience and teaching abilities to serve as part-time teachers or guest professors.

### *3.3 Provide practical opportunities*

①Establishing an internship base

Internship base is an important place for students to apply their learned knowledge to practice. By collaborating with enterprises to establish internship bases, students can be provided with a real workplace environment and rich practical opportunities. During the internship, students can personally experience the operation mode, workflow, and technical requirements of enterprises, deepening their understanding and mastery of the knowledge they have learned. At the same time, internship bases can

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also help students establish professional networks, accumulate work experience, and enhance their professional qualities. In order to ensure the effective operation and management of internship bases, universities can work together with enterprises to develop internship plans, arrange internship positions, and guide teachers.

②Carry out enterprise visits and exchange activities

In addition to establishing internship bases, universities can also organize students to visit and exchange activities with enterprises. These activities can allow students to have a close understanding of the production process, technological innovation, and cultural atmosphere of enterprises, enhancing their knowledge and understanding of them. At the same time, through communication and interaction with enterprise employees, students can learn about the latest developments and trends in the industry, as well as the needs and requirements of enterprises for talent. These pieces of information are of great significance for students' career planning and development. In order to ensure the smooth progress and effectiveness of visits and exchange activities, universities can work together with enterprises to develop activity plans, arrange activity times and locations, etc.

### *3.4 Jointly carry out scientific research projects*

①Establish a joint research center

The Joint Research Center is an important platform for both schools and enterprises to jointly carry out scientific research projects. By establishing a joint research center, the research resources and strengths of both schools and enterprises can be integrated to jointly tackle technological challenges, promote technological innovation and industrial upgrading. Joint research centers can focus on the core technologies and market demands of enterprises for scientific research layout and project management; At the same time, it can also provide opportunities and platforms for scientific research practice and innovation and entrepreneurship for university teachers and students. In order to ensure the effective operation and management of the joint research center, both schools and enterprises can jointly develop research plans, allocate research resources and funds, etc.

②Applying for joint research projects

In addition to establishing joint research centers, schools and enterprises can also jointly apply for national and local scientific research projects. These projects usually have high research value and broad application prospects; At the same time, it can also provide research funding and talent support for both schools and enterprises. When applying for joint scientific research projects, both schools and enterprises need to fully communicate and negotiate, clarify research directions and goals, as well as their respective division of labor and responsibilities; At the same time, detailed research plans and implementation plans need to be developed. By jointly applying for scientific research projects, not only can we promote in-depth cooperation and communication between schools and enterprises; It can also bring dual benefits such as scientific research achievements and economic benefits to both parties.

### *3.5 Strengthen teacher enterprise practice*

①Teacher enterprise secondment training

Teacher enterprise secondment training is an important way to enhance teachers' practical ability and teaching level. Arrange teachers to participate in activities such as secondment training or internship practice in enterprises; Teachers can gain a deeper understanding of the operational models and technical requirements of enterprises; At the same time, it can also enable teachers to apply their learned knowledge and experience to practical work and accumulate practical experience. These practical experiences can not only enrich teachers' teaching content and case materials; It can also improve the teaching quality and effectiveness of teachers, as well as enhance their practical guidance ability. In order to ensure the smooth progress and effectiveness of teacher enterprise secondment training; Universities can work together with enterprises to develop on-the-job training plans and implementation strategies, and strengthen management and assessment work.

②Lectures by Enterprise Experts on Campus

Enterprise experts giving lectures on campus is an effective way to introduce industry wisdom and broaden students' horizons. By inviting enterprise experts with rich practical experience and industry insights to give lectures at the school, students can get up close to the forefront of industry dynamics,

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technological development trends, and enterprise employment standards, thereby stimulating their interest in learning and clarifying their career direction. The lecture content can cover various aspects such as industry overview, corporate culture, technological innovation, career development, etc. The format can also be flexible and diverse, such as special lectures, roundtable dialogues, interactive Q&A. In order to ensure the quality and effectiveness of lectures, universities should communicate and negotiate with enterprise experts in advance, determine the theme and format of lectures, and do a good job in publicity organization and logistical support. At the same time, encourage teachers and students to actively participate, engage in in-depth exchanges with experts, and jointly explore academic and technical issues.

### *3.6 Carry out employment guidance and recruitment activities*

①Enterprise participation in career planning

Career planning is an important process to help students clarify their career goals and develop development plans. Universities should actively invite enterprises to participate in career planning education, through forms such as enterprise mentorship systems, career planning lectures, and career experience activities, to enable students to gain a deeper understanding of the requirements and prospects of different career positions, as well as the standards and preferences of enterprise employment. Enterprise experts can provide personalized career guidance and advice to students based on their own experience and industry experience, helping them establish correct career concepts and develop reasonable career plans. Meanwhile, universities can also collaborate with enterprises to establish career planning databases or information platforms, providing students with rich career information and resource support.

②Holding campus job fairs

Campus job fairs are an important platform for students to directly connect with enterprises and achieve employment. Universities should regularly hold campus job fairs and invite various enterprises to recruit talents on campus. In order to ensure the effectiveness of job fairs, universities should do a good job of publicity and promotion in advance, and release recruitment information and list of participating companies through various channels such as campus networks, social media, posters, etc; At the same time, strengthen communication and coordination with enterprises, understand their recruitment needs and employment standards, and provide accurate employment guidance and recommendations for students. At the job fair, universities should provide comprehensive venue facilities and service guarantees, such as booth layout, audio equipment, order maintenance, etc; At the same time, encourage students to actively participate, communicate face-to-face with recruiters, and showcase their talents and strengths. In addition, universities can also organize specialized job fairs or industry job fairs to provide precise matching and recruitment services for specific majors or industries.

## 4. Conclusion

The talent cultivation model of school enterprise collaboration is an effective way to improve the quality of engineering education and the competitiveness of students in employment. By establishing a long-term cooperation mechanism, jointly modifying talent training plans, jointly developing school enterprise cooperation courses, providing practical opportunities for efficiency by enterprises, jointly carrying out scientific research projects by schools and enterprises, strengthening teacher enterprise practice, conducting employment guidance and recruitment activities, etc., deep cooperation between schools and enterprises can be achieved to cultivate high-quality engineering and technical talents that meet market demand. In the future, the further deepening and promotion of the school enterprise linkage model will provide strong support for the development of engineering education.

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