Research on the Development Model of Computer Course Resources in Vocational Colleges Based on the Integration of Industry and Education

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Abstract. China is currently experiencing a critical period of development in vocational education from a scale-based approach to a content-based approach. The integration of industry and education is considered the main theme of vocational education reform, and one of its core issues is curriculum construction. The traditional reform of computer courses has a series of problems in terms of matching the structure with talent training goals, matching the content with professional job requirements, and integrating the evaluation system with professional development. To address this challenge, this article focuses on the construction of integrated curriculum resources between industry and education, with student ability cultivation as the core, and is committed to strengthening the deep connection between talent cultivation and enterprise development. To this end, we have explored and proposed a development model for industry education integration courses based on the concept of "school enterprise coeducation - practical majors - industry connectivity - zero distance docking", in order to solve many problems faced by traditional computer course reform and promote vocational education to move towards a more connotation rich development stage.

Keywords: Vocational education, Integration of industry and education, Construction of Computer Courses.

1. The necessity of integrating industry and education in computer courses

1.1. Effectively solving the dilemma of professional construction funding investment

Vocational education aims to cultivate professional talents with advanced technical skills and provide support for regional economic development. Emphasizing practical operation ability is crucial in the cultivation process. However, given the constantly evolving nature of computer technology, professional construction faces challenges that keep pace with technological development.

At present, solving the problem of synchronizing professional training with technological development requires a large amount of investment, including experimental training venues, equipment updates, and knowledge reserves of practical mentors. These investments often come with high costs, causing vocational colleges to face difficulties in professional construction. In order to effectively address this challenge, deepening the integration of industry and education has become a feasible way to incorporate enterprises into one of the important entities of professional construction.

Through deep cooperation with enterprises, vocational colleges can share practical experience and resources, reduce cost pressure, and improve the effectiveness of professional construction. This involves the rational utilization of software and hardware resources, the co-construction and sharing of experimental and training venues, and the participation of corporate mentors. The integration of industry and education not only helps to solve the problem of funding investment in professional construction in vocational colleges, but also promotes students to better adapt to industry needs and promote sustainable development of regional economy.

1.2. Effectively solving the employment problem of computer professionals

The vast majority of universities still adopt traditional teaching methods in talent cultivation, which makes it difficult for students to be competent in actual job positions after graduation. The school enterprise cooperation model is a feasible solution. Through direct interaction with enterprises, students can have an early understanding of potential future positions, systematically master relevant vocational skills, and better meet employment challenges. This model helps to improve the effective utilization rate of computer talents, cultivate higher quality professional talents, and achieve reasonable allocation of human resources.

The deep integration of industry and education further strengthens the employment-oriented concept of vocational colleges, making them more closely adjust their professional structure, teaching content, and allocate teaching resources around industrial development. By deeply integrating industry demands, vocational colleges can cultivate higher-level talents, provide the market with technical and skilled talents that meet industry standards, and substantially improve the employment quality of students. This deep integration model creates good opportunities for close collaboration between schools and enterprises, laying a solid foundation for cultivating computer professionals who can adapt to industry changes and have practical work abilities. SSD key technology points.

1.3. Helps to build a high-level "dual teacher" team

Building a "dual teacher" teaching staff is an important guarantee for the characteristics and level of vocational colleges. In the process of building this teaching staff, there is a dual task of transformation and improvement. Although vocational colleges have established a certain foundation in the "dual teacher" teaching team, the overall technical level still needs to be improved. There is a certain lack of practical ability among school teachers, and the ability distribution of personnel from both schools and enterprises is uneven. At the same time, the integration of enterprise engineers into teaching also faces some difficulties.

The integration of industry and education provides urgent support for the construction of the "dual teacher" teaching staff, effectively solving the problem of weak foundation of the "dual teacher" teaching staff. In the training of computer professionals, the integration of industry and education has become a necessary means to promote closer cooperation between schools and enterprises, and better integrate the actual needs of enterprises into the teaching system.

Through the integration of industry and education, schools can more quickly adapt to the requirements of technological development, providing strong support for the transformation of the teaching staff. This deep integration not only solves the problem of insufficient technical level, but also helps to enhance the practical ability of teachers, balance the ability distribution of personnel from both schools and enterprises, and make it easier for enterprise engineers to integrate into the teaching environment. Overall, the integration of industry and education injects new vitality into the construction of the "dual teacher" teaching staff, providing a practical and feasible way for vocational colleges to enhance their characteristics and level.

Overall, it is necessary to apply the integration of industry and education to develop course resources in the training of computer professionals. Deepening the integration of industry and education is considered an important way for schools to solve problems that are detached from society and theory from practice. By building a school enterprise deep cooperation technology platform that integrates industry, education, research, teaching, and application, not only can the teaching and research level of the school be improved, the ability of the teaching staff be enhanced, but also the participation and contribution rate of the school in regional economic and social development can be enhanced.

The implementation of deep integration of industry and education not only helps to enhance the influence and discourse power of schools in industry enterprises, but also creates a good external environment for the development of schools. This positive external environment, in turn, provides better conditions for gathering resources to promote deep integration of industry and education. Therefore, by integrating industry and education, schools can better meet social needs, make their

education more practical, and provide stronger support for cultivating computer professionals with practical work abilities.

2. The problems in the development of course resources for computer majors in vocational colleges

2.1. Schools do not attach enough importance to the integration of industry and education

There is a superficial understanding of the concept in the integration of industry and education in schools, which has resulted in the actual effectiveness of the integration model not being fully realized. In some schools, the understanding of the integration of industry and education in talent cultivation has not yet reached a clear level of positioning and responsibility, and there is a mismatch between educational guidance and student training, making it difficult for students to adapt to actual internship positions in enterprises. This situation forces companies to provide additional secondary training for computer talents, ultimately leading to many companies losing interest in the integration of industry and education.

In the practice of industry education integration, schools should have a deeper understanding of the concept to ensure that the goal of industry education integration is fully realized. Firstly, schools need to have a clear understanding of their positioning and responsibilities in the integration of industry and education. This includes clarifying the school's teaching vision, training objectives, and specific ways of collaborating with industries. Only by accurately positioning and clarifying responsibilities can schools better guide students towards practical needs and improve their competitiveness in the professional field.

In terms of educational guidance and student development, schools need to ensure alignment with the actual needs of enterprises and avoid misalignment. By gaining a deeper understanding of industry trends and technological developments, schools can design courses and teaching plans more targeted, enabling students to possess the necessary professional knowledge and practical abilities before entering internship positions. This educational model not only helps students better adapt to practical work requirements, but also enhances the attractiveness of cooperation between schools and enterprises, thereby avoiding situations where enterprises lose interest in the integration of industry and education.

2.2. The course design is not reasonable enough

Due to insufficient understanding of the integration model of industry and education, schools have failed to prioritize student ability development in the development of teaching plans and curriculum design, resulting in inadequate alignment between educational content and industry needs. This results in many students not effectively mastering professional knowledge and practical abilities before entering internship positions.

Specifically, in the practice of integrating industry and education, some schools lack clear goals for cultivating student abilities in their teaching plans and curriculum designs, and fail to accurately meet the actual needs of the industry. This unreasonable design leads to students being unable to perform the required tasks in internship positions, resulting in a lack of professional knowledge and practical abilities.

In the context of industry education integration, an ideal teaching plan should closely integrate industry standards and practical application scenarios to ensure that students can perform well in internship positions. Schools need to have a deeper understanding of the needs of industries in order to highlight key skills and knowledge points in curriculum design. Only by clarifying the goals of cultivating student abilities and integrating them into teaching strategies can schools better meet industry expectations and ensure that students perform better in practical work. This is also a key step in achieving the goal of integrating industry and education.

2.3. The teaching staff needs to be improved

Currently, many schools have significant weaknesses in the teaching staff of computer majors. When teachers participate in computer science teaching, there is generally a lack of teaching level and knowledge and skill reserves. This situation is mainly manifested as an excessive emphasis on theoretical knowledge and a lack of sufficient practical skills, which directly affects students' learning and career development. Therefore, the students trained often find it difficult to meet the actual needs of enterprise positions.

In the field of computer science, rapidly changing technology and market demands have put higher demands on teachers. However, the teaching staff of many schools have not been able to keep up with this change in a timely manner, resulting in a relative lag in the teaching level of teachers. They may place more emphasis on imparting theoretical knowledge and overlook the importance of practical operations. This makes it difficult for students to successfully cope with career challenges when facing real job demands in enterprises, as they lack sufficient practical skills.

To address this issue, schools need to pay more attention to the training and improvement of their teaching staff. A continuous teacher professional development plan and practical experience sharing platform can help teachers better adapt to the development trends in the computer field. By improving the practical skills of teachers and closely linking course content with industry reality, schools can more effectively cultivate computer professionals who can meet the needs of enterprises. This improvement not only helps to enhance students' learning experience and career competitiveness, but also aligns with the goal of integrating industry and education.

2.4. Disconnection between talent cultivation and talent demand

Due to the rapid updates in computer technology, many universities have a significant lag in formulating talent training plans. This lag is mainly due to insufficient follow-up on technological changes, resulting in training programs that cannot reflect the latest industry trends and technical requirements in a timely manner. In addition, due to limitations in experimental and practical training conditions, as well as the total number of credits, some professional courses have not been fully offered. At the same time, factors such as insufficient teaching staff and insufficient internship funds in internship management also limit the arrangement of students for professional internships in enterprises. This series of problems makes it difficult for computer science students to have the opportunity to access the latest technology, and their practical abilities are relatively low, leading to a disconnect between the talent they cultivate and the industry's needs.

In response to this issue, universities need to actively respond to the rapid development of computer technology, update talent training programs in a timely manner, and ensure that the students they cultivate possess skills and knowledge that meet current industry standards. By establishing a flexible curriculum system and introducing content from emerging technology fields, we can adapt to the development trends of the industry. At the same time, addressing the limitations of experimental and practical training conditions and total credits to ensure that students can comprehensively and systematically learn computer related knowledge.

In addition, strengthening the teaching staff for internship management and increasing investment in internship funds will help improve students' practical abilities. By strengthening cooperation with enterprises, establishing a stable internship base, and providing students with more practical job opportunities. This improvement will effectively reduce the phenomenon of disconnection in the training process, enable students to better adapt to industry needs, and enhance their competitiveness in the workplace.

3. Development Model of Industry Education Integration for Computer Majors in Vocational Colleges

Improving the quality of talent cultivation and strengthening the close connection between talents and the economy and society has always been the core goal of deepening the integration of industry

and education. The integration of industry and education in talent cultivation is considered an indispensable way to promote vocational education, and school enterprise cooperation is an important means to achieve this goal. Therefore, we must firmly promote the reform of the "school enterprise dual subject" education model. Given the current situation faced by vocational colleges in the development of computer related course resources, we propose a course resource development model centered on industrial colleges and based on the concept of industry education integration.

Deepening the integration of industry and education aims to enhance the adaptability of talents cultivated by schools in practical work, so as to better serve the development of the economy and society. The talent cultivation model of industry education integration has been recognized as an indispensable direction for leading the development of vocational education, and school enterprise cooperation, as an important means, is an effective way to achieve industry education integration. Therefore, we must firmly promote the reform of the "school enterprise dual subject" education model to ensure that the talents cultivated by schools better meet the needs of the industry.

We propose a curriculum resource development model centered around industrial colleges to address the issues in the development of computer related courses in vocational colleges. This model takes the industry college as the carrier, and fully integrates school and enterprise resources to meet the skills and knowledge required by students in practical work. By closely integrating industry trends and technological innovation, this model based on the concept of industry education integration will help improve the practical applicability of the curriculum and enable students to better adapt to the challenges of future career development, as shown in Fig 1.

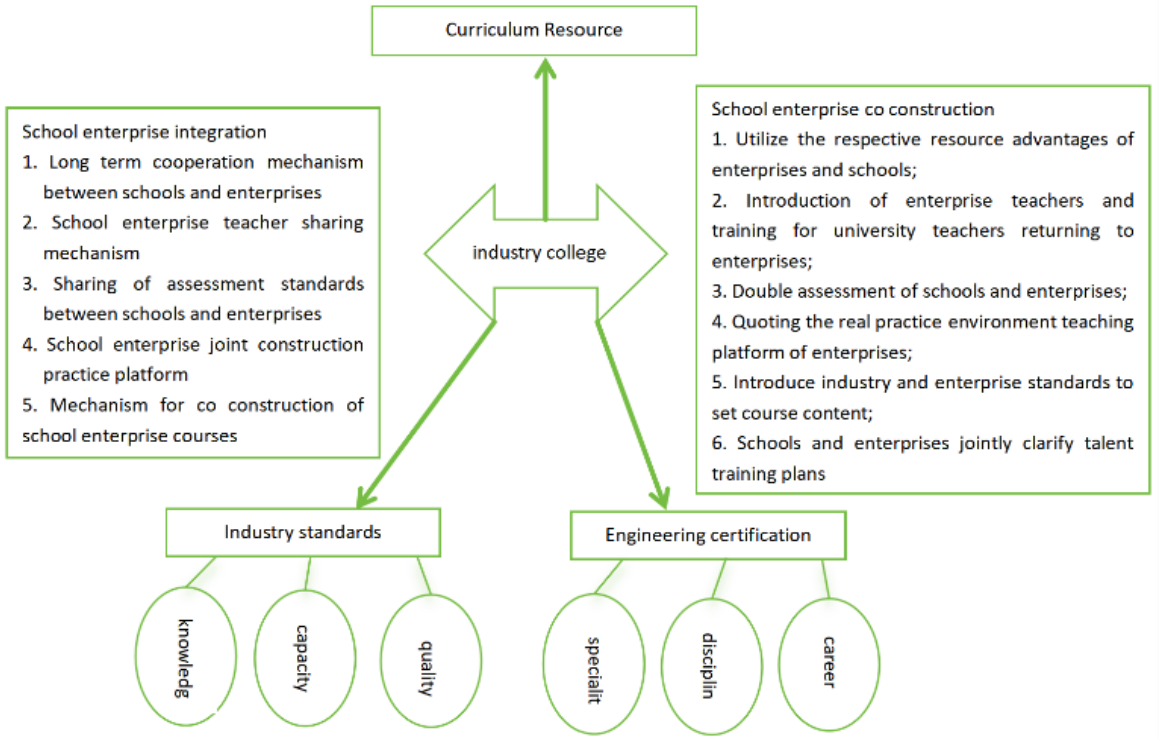

Figure 1. A curriculum resource development model based on the integration of industry and education, using industrial colleges as carriers

3.1. Long term cooperation mechanism between schools and enterprises

Establishing a long-term school enterprise cooperation mechanism can fully leverage the resource advantages of both enterprises and schools. This cooperation model enables enterprises to provide internship positions, production equipment, and cutting-edge production technology for students on the one hand, while universities can contribute excellent teaching staff and research talents on the other hand. In the process of constructing a long-term cooperation mechanism, we should actively develop industry education integration enterprises and cultivate more excellent partners. At the same time, we

also need to enhance the initiative of enterprise participation and change the passive situation of enterprise participation under traditional models.

To achieve this goal, we can actively develop industry education integration enterprises and cultivate more potential partners for cooperation. This includes establishing closer connections with enterprises, understanding their needs and development directions, in order to better formulate cooperation plans. At the same time, in order to enhance the proactive participation of enterprises, we can establish more flexible and attractive cooperation frameworks, making enterprises more willing to participate in the school's talent training program and curriculum planning.

In the school enterprise cooperation mechanism, enterprises should provide comprehensive support for the school in terms of human resources, technical training, and practical training venues in the long term. Enterprises should also actively participate in the design of talent training programs and curriculum planning, and regularly optimize and adjust the curriculum in combination with the development direction and actual needs of the industry to ensure that the curriculum is progressiveness and practical. Through this approach, a stable and effective long-term cooperation mechanism between schools and enterprises can be established, enabling schools and enterprises to achieve a higher level of collaborative cooperation in talent cultivation.

3.2. Mechanism for Sharing Teachers between Schools and Enterprises

To ensure that the teaching content of computer practical courses takes into account both theoretical knowledge and technical applications, vocational colleges should work together with enterprises to build a professional teaching team to enrich the teaching staff. Cultivating "dual teacher" teachers through flexible methods such as external introduction and sending teachers to enterprises has become an important measure. In this process, cooperation with enterprises can be used to develop a senior talent introduction and teaching plan to ensure the high-level quality of the professional teaching team.

On the one hand, vocational colleges can establish close cooperative relationships with enterprises and jointly develop plans for introducing and teaching advanced talents. Through such cooperation, the school can attract and introduce professional talents with rich experience and advanced knowledge in the field of computer science, providing strong support for practical courses. On the other hand, develop a training program for faculty and staff returning to the enterprise, send young teachers to the enterprise for practical learning, and enable them to have a deep understanding of the actual production and operation methods and technical key content of the enterprise. Such practical learning not only helps to enhance the professional competence of teachers, but also comprehensively enhances their comprehensive abilities.

Through project cooperation with the Industrial College, it is possible to flexibly introduce talents and industry experts, driving professional teachers to sublimate their engineering innovation ideas and dedication. This approach can effectively promote the combination of theory and practice, and cultivate a teacher team with more practical skills and innovative spirit. Focusing on cultivating outstanding teachers who integrate theory and practice, as well as those who pursue both moral and professional education, and exploring the "dual teacher" teacher training model through school enterprise cooperation, will become an effective way to promote the quality improvement of practical courses in computer related majors.

3.3. Collaborative Practice Platform between Schools and Enterprises

Schools and enterprises jointly build practical teaching platforms to strengthen the cultivation of students' practical operation and technical application abilities, thereby improving the quality of talent cultivation and enhancing the satisfaction of enterprises with schools and students. This helps to achieve the organic integration of theoretical teaching and practical teaching, establish "school enterprise" as the main body of the teaching process, and promote deep cooperation between universities and enterprises, constructing a comprehensive "school enterprise dual body" industry education integration practical teaching platform for college student internships, innovation and entrepreneurship, and achievement incubation.

In the process of jointly building the platform, schools and enterprises should work closely together to set practical teaching goals and clarify the practical operational skills and technical application abilities that students should possess. This helps to better meet the industry's demand for talent and enhance the comprehensive quality of the students cultivated. At the same time, by jointly building a practical teaching platform, the cooperation relationship between schools and enterprises can be further narrowed, achieving mutual benefit and win-win for both parties.

In the operation of practical teaching platforms, attention should be paid to combining theoretical knowledge with practical operations, so that students can apply the knowledge they have learned in a real work environment. This helps to cultivate students' practical problem-solving abilities and innovative thinking. Meanwhile, through in-depth evaluation of the practical process, it is possible to more effectively measure students' comprehensive abilities and enhance the effectiveness of talent cultivation.

The construction of this "school enterprise dual body" industry education integration practical teaching platform can not only better meet the needs of enterprises for high-quality talents, enhance the employment competitiveness of students, but also help promote deep cooperation between universities and enterprises, and jointly promote the development of industry education integration.

3.4. Co construction mechanism of school enterprise curriculum

In the process of curriculum and textbook construction, introducing industry standards is an important measure to enhance the professionalism and practicality of curriculum design. Enterprises actively participate in curriculum design during this process, aiming to organically integrate theoretical teaching with practical teaching, achieve organic integration of teaching and work, assessment and industry qualifications, and jointly build and plan a more practical curriculum system. This collaborative model helps to better align educational content with industry requirements and enable students to better adapt to the actual work environment.

By working closely with enterprises, we can strengthen research on the reform of the curriculum system and content. The practical experience and industry insights of enterprises can provide valuable references for the practical application of course content. At the same time, participating in innovation and entrepreneurship education research and advanced technology development research together will help integrate the latest industrial trends and technological innovation into the curriculum system, allowing students to be exposed to the latest knowledge and practice.

In this process of cooperation, schools and enterprises can jointly evaluate the implementation effect of the curriculum through regular communication and cooperation, adjust and optimize the education content in time to ensure the progressiveness and practicality of the curriculum system. This close school enterprise cooperation model will provide students with richer practical experience and better support for their career development. Meanwhile, through such cooperation, schools and enterprises can better meet their respective needs and achieve win-win development.

3.5. School enterprise joint training plan

Both schools and enterprises actively establish a professional teaching guidance committee to guide the formulation and revision of talent training programs. Based on thorough research, both schools and enterprises will design talent training objectives, training specifications, graduation requirements, and curriculum systems. Once the initial draft of the talent training plan is formed, both the school and the enterprise will invite disciplines, industries, enterprises, and experts to conduct discussions to ensure the rationality of the plan. Based on the opinions of the argument, improve and modify the talent training plan. Through various activities such as new student enrollment education, training program interpretation meetings, and professional introduction courses, students can gain a preliminary understanding of the overall framework of the training program; Through collective lesson preparation, teaching discussions, and other forms, teachers can gain a deeper understanding of the structure of the curriculum system, as well as the position and value of each course in the entire system.

During the implementation process, both schools and enterprises fully listened to the opinions of all parties and established a feedback mechanism for continuous improvement of talent training programs. After completing the training task, conduct surveys on graduates, employers, and social satisfaction to understand the opinions and suggestions of all parties on the talent training plan. According to the survey opinions, a new round of revision work will be carried out to continuously update the goals and specifications of talent cultivation, the design of curriculum system, and the arrangement of teaching content, so as to continuously improve the talent cultivation plan through dynamic adjustment. This feedback mechanism helps to ensure that talent cultivation programs always closely meet market demand and industry development trends, provide students with more practical educational content, and enhance close cooperation between schools and enterprises. In this paper, the improved SSD model is used for target detection on the airport runway foreign body data set, focusing on small target detection. Experiments show that the improved SSD model's detection performance for small target objects is due to the original SSD. The next step is to study how to improve the real-time detection.

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