Research on the Collaborative Education Model between School and Enterprise for Computer Majors Based on Huawei Certification Standards

Chunyang Chen¹, Shuanglong Pang ²*, and Desheng Zeng ²

¹ Secondary Vocational School, Guangdong Innovative Technical College, Dongguan, China
² Information Engineering Institute, Guangdong Innovative Technical College, Dongguan, China

Abstract. In recent years, with the rapid development of the computer industry, the requirements for computer talents are also increasing. At present, some universities' talent cultivation models cannot meet the development requirements of the computer industry. In response to this situation, this article proposes a school-enterprise collaborative education model based on Huawei standards, guided by market demand and starting from school-enterprise collaborative education, aiming to improve the quality of talent cultivation from multiple aspects such as professional construction, school-enterprise cooperation, and course assessment methods.

1. Introduction

This article aims to address the issue of the mismatch between the talent cultivation plan for computer majors and the needs of enterprise talents, as well as the insufficient training of students' professional abilities, and to carry out innovative practice in talent cultivation in computer majors. By introducing high-quality ICT enterprises to form a talent cultivation alliance, Huawei certification standards were introduced during the talent cultivation process, forming a talent cultivation plan based on Huawei certification for course certification integration.

In the process of formulating the talent training plan for computer majors, Huawei's vocational certification standards and curriculum system are introduced, combined with the requirements of HCIA, HCIP, and HCIE certification. In the teaching process of the talent training plan, Huawei's vocational certification exam outline and curriculum system are integrated by grade, and a curriculum certificate integration talent training system is constructed. The vocational skill level certificate is the learning achievement of students during their school years and also serves as a recognition of their vocational skill level. A vocational certificate can reflect the ability requirements of a professional position, reflect the professional abilities required for the development of the enterprise and society, and comprehensively cover the knowledge learned in the profession, the professional literacy and skills required by the enterprise. It can be divided into three levels based on the difficulty of the assessment: elementary, intermediate, and advanced. In the process of talent cultivation, schools and enterprises collaborate to build practical training bases, build online course resources based on Huawei certification standards, and carry out activities such as jointly building teachers, teaching, and teaching materials to improve the level of professional construction. Introduce real projects and cases from cooperative enterprises, construct practical project-based teaching resources, and achieve the goal of improving students' professional abilities and improving the quality of student training.

2. Current situation of talent cultivation

The cultivation of talents in computer science majors requires high operational skills, and the diversification of vocational education students has led to the inability of existing talent cultivation models to meet the personalized cultivation of students, mainly reflected in the following aspects.

2.1 The curriculum system lacks a dynamic adjustment mechanism

Due to the diversity of students and other factors in higher vocational colleges, students generally have the problem of insufficient understanding and cognitive ability. The demand for talent in the IT market is changing rapidly. Currently, the talent cultivation plans and curriculum systems for computer majors in most universities are relatively lagging behind, and the curriculum system designed for students cannot meet the needs of the industry. The curriculum and positioning of talent cultivation are not precise enough, and the teaching content cannot be combined with the current needs of enterprises and social development. Therefore,
the talents cultivated are easily disconnected from market demand [1].

2.2 Lack of professional ability in the teaching staff

The teaching staff of computer majors is the key to talent cultivation and a key factor in school enterprise cooperation. IT technology is a highly practical and rapidly developing industry that requires not only professional theoretical knowledge but also practical skills in the production process of enterprises[2]. However, currently, most computer science teachers in vocational colleges lack enterprise experience and lack the ability to apply new technologies, products, and achievements of enterprises. They are unable to combine typical industry cases with course practice, and cannot achieve the training goals of vocational colleges for students.

2.3 Lack of innovative ability in talent cultivation

At present, some vocational colleges lack industry standard guidance in the talent cultivation system for computer majors, and the cultivation of students lacks the cultivation of innovative spirit and entrepreneurial consciousness. The teaching content is disconnected from society and enterprises. With the development of the new economic form and new industrial system in the Greater Bay Area, there are new requirements for the training of computer professionals. The existing talent training plan design is not reasonable enough, and the curriculum system is not perfect enough. From the perspective of training objectives, models, and mechanisms, they can no longer match the structure of the Greater Bay Area's economic system[3].

2.4 Lack of sustainability in school enterprise cooperation

At present, many vocational colleges lack sustainability in their school enterprise cooperation models, and the effectiveness of school enterprise connection is poor. Schools are more concerned with the effectiveness of talent cultivation, and enterprises want to survive and develop, and they are more concerned with actual benefits. In order to reduce the cost of cultivating students, enterprises actively reduce their investment in the teaching process in the construction of the teaching system, resulting in the surface of the school enterprise cooperative teaching model and the depth of school enterprise cooperation not meeting expectations[4]. Due to the lack of sufficient corporate elements, the school's perception of market demand has decreased, and students are unable to learn the latest technological developments in a timely manner, resulting in a significant gap between the cultivation of students' abilities and the demand for talent from enterprises.

3. Reform path of talent cultivation mode

3.1 Introduce Huawei professional certification standards and integrate talent training programs for computer related majors.

Carry out in-depth cooperation with high-quality ICT enterprises such as Huawei Technology Co., Ltd. and build the Huawei Information and Network Technology College. At the same time, Huawei professional certification standards are introduced, and schools and enterprises jointly develop talent training programs for computer network technology and other majors. The exam outline, training environment requirements, and teacher requirements of Huawei certification standards are integrated into the professional talent training program. From the perspective of differences in students' abilities and their career development, the Huawei certified HCIA, HCIP, and HCIE three-level certification course system and online course resources will be integrated into the course teaching content, and a layered and segmented course system will be constructed to cultivate high-quality technical and skilled talents in computer science majors that meet the needs of enterprises.

3.2 Introduce real project cases from enterprises, carry out project-based teaching, and enhance students' professional abilities.

Introduce high-quality enterprises such as Huawei, establish talent training alliances, establish a comprehensive education platform based on studios, carry out joint construction of practical training bases between schools and enterprises, jointly cultivate teachers, and carry out teaching, scientific research, and other activities. Introduce Huawei course resources, real enterprise projects, and case studies, transform them into project-based teaching resources, and adjust course evaluation standards appropriately based on the characteristics of professional grades and learning levels. Set different teaching objectives, and build a progressive course system. In the classroom, provide practical training for students through real enterprise cases or projects, and achieve the goal of improving their professional abilities.

4. Innovation in talent cultivation mode

4.1 Innovation Talent Training Reform and Practice

Collaborating with schools and enterprises to build an ICT talent training platform, we will deepen the reform and construction of computer related majors. In accordance with the requirements of Huawei's vocational certification system at the initial, middle, and high levels, we will adopt a layered and segmented approach to build a curriculum system that integrates courses and
certificates. This will achieve an organic connection between the vocational certification outline and the course teaching content, and clarify the career development path for students. In the process of teaching implementation, the process assessment method and flipped classroom teaching mode are adopted to explore ways to improve the quality of education, improve students' learning effectiveness and practical abilities in multiple aspects, cultivate more high-quality technical and skilled talents in computer science, and achieve the goal of serving the local economic and social development.

4.2 Establishing a talent training alliance to achieve collaborative education between schools and enterprises.

By introducing high-quality ICT enterprises such as Huawei, a talent training alliance is established to build a platform for the cultivation and employment of computer professionals. In the process of developing talent cultivation plans, based on the characteristics of regional economic development and the school's positioning, we fully utilize the talent cultivation alliance to conduct talent demand research, accurately locate talent cultivation goals, and solve the current problem of talent supply differences in computer science majors. Using the school enterprise co construction studio as the carrier, we introduce Huawei online course resources, real enterprise projects, and cases, and transform them into classroom teaching content to enhance students' engineering practical abilities.

4.3 Introduce hierarchical vocational skill level certificates to clarify career development paths

Utilizing the exam syllabus and curriculum system certified by Huawei, combined with student characteristics, the curriculum system for computer majors is restructured to carry out hierarchical and segmented progressive talent cultivation. At the same time, from the perspective of career development for computer professionals, the introduction of Huawei's HCIA (Junior), HCIP (Intermediate), and HCIE (Advanced) three-level certification system is in line with the spirit of the "National Vocational Education Reform Implementation Plan" and the "Pilot Plan for Implementing the" Academic Certificate+Several Vocational Skill Level Certificates "System in Colleges and Universities", clarifying the career development path of students.

4.4 Utilize enterprise resources to achieve the integration of "post, course, competition, and certification"

Based on school enterprise cooperation, introducing Huawei vocational skill level standards, and utilizing the high-quality resources of the enterprise, we aim to build a talent cultivation model that is based on the needs of the enterprise and results oriented with Huawei professional talent training model, and deeply integrated this model into talent training plans for computer related majors, creating a vocational junior stage corresponding to the Huawei level certificate standards for computer related majors A platform for cultivating high-quality technical and skilled talents in the intermediate and advanced stages of careers, continuously improving students' IT technology related professional qualities and their ability to adapt to the social development of the Greater Bay Area.

5. Measures for talent cultivation mode

In the process of collaborative education, both schools and enterprises should further strengthen the connotation construction, fully leverage the community role of universities and industries in talent cultivation mode, and achieve a collaborative mechanism throughout the entire process of talent cultivation, namely, forming a talent cultivation alliance, collaborating on the development of talent cultivation plans, collaborating on the construction of curriculum systems, and collaborating on the construction of industry education integration bases[5].

![Figure 1. Talent cultivation measures.](https://doi.org/10.1051/shsconf/202317101025)

5.1 Establish a talent training alliance and introduce Huawei professional certification standards

Introduce high-quality enterprises such as Huawei, sign school enterprise cooperation agreements, form talent training alliances, and jointly build Huawei Information and Network Technology College. The school and enterprise have conducted in-depth cooperation on the entire cooperation project in various aspects such as theoretical knowledge teaching, hands-on ability training, and comprehensive quality cultivation. By collaborating to build laboratories, introducing Huawei's training system, course system, and online course resources, we will gradually improve and enhance the school's ability to cultivate innovative talents. In accordance with the requirements of Huawei Vocational Certification, the content of the HCIA (Junior) and HCIP (Intermediate) certification outlines will be integrated into the
professional core curriculum system in the training specifications, and the HCIE (Advanced) certification outline will be integrated into the professional expansion curriculum. The goal is to combine Huawei's leading advantages in technology and services with the advantages of cultivating localized innovative applied talents, striving to serve regional economic construction and promote the development of universities.

5.2 Collaborative development of professional talent training programs between schools and enterprises

In the process of formulating talent cultivation plans, based on Huawei's professional certification standards, with the goal of cultivating Huawei ICT talents, schools and enterprises jointly research and develop computer related professional talent cultivation plans, timely incorporating Huawei's technical specifications and talent cultivation system into teaching standards and content, and strengthening students' course training. Reform the innovation and entrepreneurship education model, promote the integration of curriculum and innovation, and integrate learning and training into a new teaching model[6]. On the basis of the existing framework of the school, establish a talent training alliance between the school and the enterprise, establish a talent training plan working group composed of the school and the enterprise, and jointly participate in talent training goals, curriculum system design, and vocational ability evaluation and improvement[7].

5.3 Schools and enterprises jointly build practical training bases and carry out training on industry education integration projects.

The industry education integration training base is a comprehensive training base that integrates teaching, skill training, and production internship. In terms of practical training bases, it is necessary to deepen cooperation between schools and enterprises, strengthen the sustainable linkage between industry and education, attach importance to talent cultivation, combine the characteristics of computer majors, fully utilize the advantages of universities' venues, equipment, and resources, and jointly build a practical training base that integrates industry and education, and jointly formulate a practical teaching production plan that integrates industry and education. Introducing teaching content in the production process, closely integrating industry and teaching, continuously innovating and developing, achieving new breakthroughs in talent cultivation in vocational colleges, and achieving the goal of a win-win situation for schools and enterprises[8].

5.4 Collaborating with schools and enterprises to build studios and carry out project-based teaching

During the establishment process of the studio, the school provides office, learning, and practical facilities, equipped with corresponding desks, chairs, projectors, and other necessary infrastructure for learning and office. The enterprise provides simulation software, training equipment, cloud access, and other training equipment[9]. Based on the work scenario of the enterprise, jointly build a studio for teaching and practice, create a good professional teaching environment, and conduct practical project exercises such as software development, design, testing, and operation and maintenance on campus. Actively promote project-based teaching and deeply integrate enterprise project-based teaching into classroom teaching.

5.5 Collaborate between schools and enterprises to cultivate teachers and create excellent teaching teams

The school enterprise joint use of the school enterprise "dual mentor model" to jointly formulate the requirements for the construction of the teaching staff. Encourage enterprise engineers to teach in schools, introduce skilled craftsmen from enterprises, and achieve the sharing of enterprise management and technical talents[10]. Strengthen the implementation of training and learning programs for teachers in enterprises, and jointly cultivate a professional backbone teaching team through mutual recruitment and dispatch between schools and enterprises. In the construction of campus studios, carry out dual mentor teaching, and fully utilize the resources of Huawei ICT College. Every year, appoint backbone teachers to participate in official teacher training and obtain the corresponding Huawei Certified College Lecturer Certificate (HCAI).

5.6 Joint assessment of students by schools and enterprises, forming diversified curriculum assessment standards

Course assessment is an important link in collaborative talent cultivation between schools and enterprises, and a key process for testing students' learning outcomes. It is necessary to jointly develop an assessment and evaluation system within and outside schools and enterprises, allowing schools and enterprises to participate in the evaluation of students' course quality, regularly checking the quality of classroom teaching and phased assessment results, and continuously improving the talent assessment mechanism. Due to the high requirements for practical training in computer science courses, they can be divided into three categories: basic courses on campus, professional courses, and extracurricular practical courses. Course assessment and evaluation can be divided into two types: theoretical assessment and practical assessment. Practical assessment and practice can be extended throughout the entire semester, with enterprise practice replacing the practical courses on campus and conducting phased assessments at several important practical nodes. The theoretical part of the course is assessed at the end of the semester, and the practical class hours and assessment parts are replaced by enterprise practice.
5.7 School enterprise dual mentors to improve the quality of internship employment

Promote the "dual mentor" joint talent cultivation model, implement a dual mentor system of collaborative education between "school internship guidance teachers" and "cooperative enterprise guidance teachers", clarify their respective responsibilities, strengthen deep cooperation between both parties, provide students with comprehensive internship guidance such as graduation design and internship entrepreneurship, guide practice with theory, and promote application with practice. In terms of employment, utilizing the high-quality resources and social advantages of enterprises, enterprises will take the lead in internship employment issues, and recommend excellent enterprises to enter the school for recruitment. Outstanding graduates who have obtained Huawei's vocational certificate can give priority to participating in the annual ICT talent selection meeting organized by Huawei, in order to improve the employment quality and professional matching rate of students.

6. Conclusion

This article analyzes the current situation of computer talent cultivation in vocational colleges and proposes measures for deepening school enterprise cooperation and curriculum assessment content based on Huawei certification standards. School enterprise cooperation is an effective way to achieve talent cultivation, which is beneficial for personalized talent cultivation of diversified students and deepening vocational education reform, and for improving the quality of talent cultivation in vocational colleges. It provides reference and reference for vocational colleges.

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