

Cultivating ICT Skilled Talents Through College-Enterprise Education Culture

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ABSTRACT

The integration of college and enterprise culture is the core path of "Double-High Plan (DHP)" construction and an effective way to promote the adult development of students. According to the present two problems of cultural integration between colleges and enterprises, i.e., the level of college-enterprise integration is relatively shallow and Lack of university - enterprise cultural integration with its own characteristics, taking the practice mode of the college-enterprise cultural integration to cultivate ICT technical skills talents carried out by Shenzhen Polytechnic and Huawei as the research object, this paper explores an effective way of the college-enterprise cultural integration to cultivate talents, and provides new ideas for the construction of the education and teaching system of the whole process of college-enterprise cooperation.

Keywords: *college-enterprise education, cultural integration, DHP*

1. INTRODUCTION

Under the background of "Double-High plan (DHP)", the talent training goal is gradually changing to compound talents and innovative workers, which needs to take the integration of industry and education as the premise, and the connotation development as the main line. Constructing the college-enterprise "double main body" education management mode and building the harmonious development demand of professional chain and industrial chain, is one of the important tasks of the "DHP" project construction and an important path for higher vocational education to cultivate high-quality technical and technical talents in the new era.

There are many problems in the college-enterprise "double-subject" education mode, which all point to the need to strengthen cultural education in the joint training between universities and enterprises. Cultural education can more easily find the meeting point of the joint education between colleges and enterprises. Shenzhen Polytechnic and Huawei Communication Technology Co., Ltd. (Huawei) have formed a relatively mature model in the integration of college-enterprise education culture to cultivate ICT technical talents. Research and exploration of this mode have great significance to the construction of the education and teaching system of college-enterprise cultural integration and the whole

process of college-enterprise cooperation and joint training of technical personnel.

2. NECESSITY AND IMPORTANCE OF CULTURAL INTEGRATION BETWEEN COLLEGES AND ENTERPRISES UNDER DHP

From the perspective of talent training objectives in higher vocational colleges, the integrate college-enterprise culture is necessary. The Implementation Plan of National Vocational Education Reform emphasizes that higher vocational colleges should carry out the fundamental task of cultivating talents by virtue, and improve the education mechanism of combining morality and skills and combining work with study. Higher vocational colleges should not only cultivate students' knowledge and skills, but also improve students' professional quality. Integrating corporate culture into the whole process of talent training, actively building a comprehensive and balanced curriculum training mode of basic knowledge, professional skills, quality and spirit, and comprehensively improve students' professional ability and quality, are consistent with the goal of talent training in higher vocational colleges ^[1].

The integration of colleges and enterprise culture is

the core path of DHP construction. In March 2019, the Ministry of Education and the Ministry of Finance issued the Opinions on the Implementation of the Plan for the Construction of High-level Vocational colleges and Majors with Chinese Characteristics, pointing out that the integration of industry and education, college-enterprise cooperation, integration into regional development and promotion of industrial upgrading should be promoted. This is the basic principle of DHP construction. Any successful cooperation must have both material and spiritual foundation. The spiritual bases, i.e., consistent goals, harmonious identification, unified norms, mutual trust atmosphere, are particularly important. These spiritual foundations, in fact, are the cultural core of college-enterprise cooperation [2]. To deepen the integration of industry and education and college-enterprise cooperation, the most basic is the integration of college-enterprise culture. The integration of college and enterprise culture is of great practical significance for improving the quality and level of technical and technical personnel training and building the characteristic brand of DHP in the construction of college and university personnel training.

The integration of college and enterprise culture in higher vocational colleges meets the needs of students' adult talents. Culture idea integrated by both sides, make the student fully perceive corporate culture, a better understanding of the characteristics and requirements of enterprise culture, enterprise's value orientation and development goals clearly, and to improve students' resilience and job matching of the enterprise, improve the students' professional ability and quality, improve the students' professional beliefs and core competitiveness.

3. PROBLEMS ANALYSIS OF THE CULTURE INTEGRATION BETWEEN COLLEGE AND ENTERPRISE

DHP colleges bear the mission of leading the reform. To strengthen the construction of college culture, especially to fully integrate the enterprise culture, and to construct the training system of high-level technical and skilled personnel, are the focuses of research and practice in various colleges and universities. From the perspective of the current effect of the integration of college-enterprise education culture in higher vocational education, there are mainly two problems:

(1) The course system of higher vocational colleges in different degrees pays too much emphasis on theoretical and ignore occupational training [3]. Teaching material content contains only professional technical knowledge, and lacks of professional quality content required by the jobs. The level of college-enterprise integration is relatively shallow. Enterprises do not really participate in the whole process of student training, and cultural integration does not play its due educational

effect, leading to the unsatisfactory results of college-enterprise cooperation.

(2) College culture and enterprise culture have their own unique connotation and essential characteristics, so they must be integrated on the basis of careful analysis of their relatively stable cultural commonness and individuality in order to realize their effective role. At present, there is no method that can reflect the research characteristics of college-enterprise cultural integration, and there is a lack of in-depth research on college-enterprise cultural integration in course system, teaching content, base construction and other aspects.

4. PRACTICAL RESEARCH ON COLLEGE-ENTERPRISE CULTURAL INTEGRATION UNDER DHP

Shenzhen Polytechnic is one of the A-grade construction units selected by 10 high-level colleges. Shenzhen Polytechnic has carried out in-depth college-enterprise cooperation with well-known local enterprises, such as Huawei, BYD, China Merchants Bureau, Ping An Technology and so on [4]. Taking the cultivation of ICT technical talents by Shenzhen Polytechnic and Huawei as the research object, this paper discusses the valuable experience of college-enterprise cultural integration leading the characteristic development of the college, and explores the college-enterprise cultural integration mode suitable for China's national conditions.

4.1 Promote the penetration and integration of two cultures through the three-party cooperation consisting of college, teacher and student

At the college level, as early as 2008, Shenzhen Polytechnic and Huawei established the first authorized Huawei training center in China. In 2011, the university established the first Huawei network technology college in higher vocational colleges in China. In 2014, two sides cooperated to build the first batch of Huawei information and network technology college in China. In 2020, Shenzhen Polytechnic - Huawei 5G Base will be inaugurated in Shenzhen Polytechnic. In more than ten years, we have carried out all-round and deep college-enterprise cooperation and integrated Huawei culture into the whole teaching process. Huawei's emphasis on talent training coincides with the college-running mode promoted by industry-university-research-application and the concept of cultural education, composite education and collaborative education of Shenzhen Polytechnic. The college and Huawei's senior management have established an irregular exchange visit system to promote the interconnection of information resources. The two sides of the college and enterprise jointly build high-level majors, develop curriculum standards, build teacher team,

set up research and development center, develop high quality certificate, and go out jointly. Taking the above mentioned six aspects as the concrete realization path, with the mode of three parties' (college, teachers, and students) cooperative, two sides promote the infiltration and integration of the two cultures.

In terms of teachers, there are teachers from Shenzhen Polytechnic going to Huawei for training every summer and winter vacation. The teachers who participate in the training are accompanied by a pair of Huawei engineers. They eat and work together. These teachers not only learn new technology and professional knowledge in the real scene, but also feel the corporate culture in such experience. At the same time, Huawei arranges engineers to carry out teaching and technical reports on campus, and jointly builds a teaching team through the integration with enterprise talents. What is more, in the past five years, Shenzhen Polytechnic has introduced 111 full-time teachers from enterprises, selected 2563 full-time teachers to practice in enterprises.

At the student level, students can accept the customized "Huawei ICT College Course" on campus. The course starts with corporate and industrial culture, conducts professional cultural education for freshmen, and helps students plan their career development according to Huawei employee standards. The courses are jointly taught by the college teachers and representatives of Huawei, and are included in the talent training program as the optional (required) credit courses for students. Students can also participate in the ICT Competition of college students every year and various professional certification examinations held by Huawei. These competitions and certifications are integrated with Huawei's advanced technologies, engineering cases, course resources and corporate culture, which not only show the certificate holder's excellent technical application ability, but also represent the certificate holder's good professional quality. Graduates can participate in the double selection meeting of Huawei ICT talent alliance specially set up for students of Shenzhen Polytechnic. Now, Shenzhen Polytechnic is a major employer of Huawei and its enterprises. Students can experience the cultural core of Huawei from the enrollment to graduation.

4.2 Promote the integration of university-enterprise culture by combining the four dimensions of material, institutional, spiritual and behavioral

4.2.1 Material and cultural integration

Communication technology professional group of Shenzhen Polytechnic and Huawei co-build the college of ICT, Huawei 5G base, jointly R&D center, elite class. By virtue of these methods, let the enterprise material culture into the construction of campus teaching

equipment and facilities. In addition, relevant professional training rooms are designed as high level integration of industry and education, such as Huawei mobile communication training platform, Huawei cloud service core network training platform. The characters and corporate culture slogans of Huawei are hanged on both sides of the corridor of the training room. Students can feel the cultural edification of the college and the enterprise imperceptibly. Teachers and students can strengthen the understanding of the enterprise and enhance the understanding of the major and occupation through the campus material environment.

4.2.2 Institutional and cultural integration

Shenzhen Polytechnic and Huawei jointly develop the course standards and plan which is integrate with the enterprise culture. Students can take the initiative to accept the education of enterprise culture in the professional education study, and deeply feel the rules and regulations, ethics, professional quality. The enterprise-oriented management in the joint base and elite class are learned. Integrating the management system of enterprises with the management system of colleges, and building a college-enterprise community of common destiny, comprehensively promote the college-enterprise dual education mechanism, and promote the harmonious integration of college-enterprise system and culture.

4.2.3 Spiritual and cultural integration

In the process of college-enterprise cooperation with Huawei, Shenzhen Polytechnic not only introduces corporate values into classroom teaching and practical training, but also gives full play to the role of secondary cultural courses, such as student associations, elite classes and academies. According to student interest, and the characteristics of the enterprise, college sets up network elite club and communication society, and guides the teachers to bring enterprise culture in students' club activities. Students supervised by teachers have the chance to visit Huawei headquarters. They can feel the spirit of enterprise culture in the real environment. The HCIE elite class jointly organized by Shenzhen Polytechnic and Huawei takes the applied HCIE elite talents of "skill certificate + project practice + professional quality" as the training goal. Based on the Huawei HCIE certificate, it introduces industry knowledge and norms, and integrates the enterprise spirit and culture into construction of the elite class. The lecture hall of Tsung Li regularly invites Huawei technicians, senior management personnel and Huawei alumni to give special lectures on campus. The experience of successful people and the cultural connotation, business philosophy and core values of the enterprise will subtly influence the students and internalize them into the professional consciousness.

4.2.4 Behavior and cultural integration

Strict project management is a good practice education^[5]. In the daily teaching activities of Shenzhen Polytechnic - Huawei ICT college, teachers design professional teaching activities according to the actual requirements of the posts and course content, and carry out course and practical training management according to Huawei management mode, so as to realize the standardization and institutionalization of management, and permeate the code of conduct that should be followed by the staff to students. Every year, a large number of students from the college will visit or practice in Huawei. During the internship, the college-enterprise cooperation agreement will be used to regulate the cooperation details between the college and the enterprise, and the college-enterprise cooperation agreement will correct and regulate the behavior habits of students.

5. REMARKABLE AND FRUITFUL RESULTES

Shenzhen Polytechnic and Huawei constantly improve the ICT skills training program and management system. The cultural exchanges between colleges and enterprises have been deepening. The cooperation between the two sides has led the new development of vocational education reform. In addition, it has created a sample for training regional talents, promoting industrial transformation and upgrading, and formulating industrial standards. As a DHP construction university, it has also provided experience and demonstration for other universities. Through the deep integration of colleges and enterprise education culture, students' professional skills and professional quality have been improved in all aspects, and the education quality of the college has been recognized by Huawei and other enterprises.

(1) More than 2000 students of Shenzhen Polytechnic have passed Huawei certifications at all levels. Among them, more than 100 students have obtained Huawei's top HCIE (Huawei Certified ICT Expert), accounting for 1% of the total HCIE in the world, ranking first among universities.

(2) Students majoring in computer network technology won the first prize in the first college students ICT skills competition of Huawei Institute in 2015

(3) Students from Shenzhen Polytechnic won the champion of the cloud track in the global finals of Huawei ICT competition for college students in 2018, the special prize (the highest prize) of the network track and the first prize of the cloud track in the global finals of Huawei ICT competition in 2020.

(4) As "Huawei power star", students from Shenzhen Polytechnic participated in the Huawei global developers' conference in 2021, escorting the smooth

holding of the conference and displaying the good style of Shenzhen Volunteers.

(5) In 2012, Shenzhen Polytechnic became one of Huawei's top ten global partners. From 2017 to 2018, Shenzhen Polytechnic became an excellent Huawei institute of information and network technology for two consecutive years.

The project, development and practice of cultivating information and communication technology skilled talents with 'Common Growth of Curriculum and Certificates' by Shenzhen Polytechnic and Huawei, won the 2018 national teaching achievement award, which explored a new college-enterprise cooperation mode for vocational education with complementary advantages of industry and education.

6. CONCLUSION

Shenzhen Polytechnic has set up three ICT skills training centers in Germany, Malaysia and Bulgaria, exporting the curriculum system standard with "Huawei Certification" as the core. In addition, related technical courses have exported to Singapore and other countries. At the invitation of the Myanmar government, Shenzhen Polytechnic designed the construction plan of the Myanmar University of Posts and Telecommunications. Departments and educational groups from UNESCO, Canada, Malaysia, Zambia, Zimbabwe and other countries (regions) have visited the college more than 80 times. Its model has become an important thrust for the human resource development of Huawei. This cooperation model between Huawei and Shenzhen Polytechnic has also been taken as a model by Huawei and promoted to other Huawei ICT Colleges.

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