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Exploration and Practice of the Construction of Enterprise New Apprenticeship Employment and Internship Bases: A Case Study of the Cooperation between YSIT Electronics and Zhejiang Dongfang Vocational and Technical College

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Abstract

School-enterprise cooperation and work-integrated learning are the most important school-running models in modern vocational education. This article analyzes the project of jointly building an enterprise new apprenticeship employment and internship base by Zhejiang Dongfang Vocational and Technical College and YSIT Electronics (Ningbo) Co., Ltd. to cultivate technical and skilled talents. The project team conducts a detailed analysis of the actual school-enterprise cooperation base construction, including the project cooperation background, the joint construction content of the school and the enterprise, the talent training goals expected to be achieved by the base construction, as well as the implementation process of the project during the base construction, and the challenges and reflections faced. On this basis, it deeply explores the important significance and practical value of cultivating electrical automation technical and skilled talents and promoting employment, providing a reference example for deepening school-enterprise cooperation and promoting the integration of industry and education for peer exchanges.

Keywords

School-enterprise cooperation; Enterprise new apprenticeship; Employment and internship base; Integration of industry and education.

1. Introduction

School-enterprise cooperation and work-integrated learning are the most important talent cultivation models in modern vocational education, as well as the most important school-running models in modern vocational education [1]. Therefore, school-enterprise cooperation and the exploration and practice of building enterprise new apprenticeship employment and internship bases are important means of cultivating technical and skilled talents and a powerful guarantee for improving the effectiveness of talent cultivation in vocational education [2]. There are certain differences between the enterprise new apprenticeship and the traditional apprenticeship. As an innovative talent cultivation model, the new apprenticeship integrates the advantages of enterprise practice and school education on the one hand, and fully considers the cultivation of practical, composite, and in - demand talents to meet market needs on the other hand. Therefore, the new apprenticeship has a very positive significance in the cultivation of skilled talents in modern vocational education [3]. This article takes the cooperation between Zhejiang Dongfang Vocational and Technical College and YSIT Electronics (Ningbo) Co., Ltd. to build an employment and internship base as an example, deeply exploring many aspects such as the implementation background, implementation plan, process supervision, existing problems, and reflections of the construction of the enterprise new apprenticeship employment and internship base.

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2. Introduction of the Cooperative Parties and the Development Background of the Enterprise New Apprenticeship

2.1. National and Local Policy Support

In recent years, in order to cultivate technical and skilled talents with high quality and actively introduce high - level skilled talents, the state and local governments have introduced many policies to provide support. In these policies, not only are there financial support and rewards in some cases, but also strong support and rewards in other aspects such as housing rental [4].

In August 2019, Zhejiang Province issued the "Implementation Plan for the New Apprenticeship System in Zhejiang Enterprises", encouraging enterprises to carry out large - scale skilled talent cultivation [1]. In July 2020, Ningbo City included the training subsidy for the enterprise new apprenticeship system in the skill training subsidy project. In December 2022, the Office of the Ministry of Human Resources and Social Security issued a notice, emphasizing the strengthening and improvement of the enterprise new apprenticeship system under the guidance of high - quality development.

2.2. Enterprise Development Needs

YSIT Electronics (Ningbo) Co., Ltd. is a well - known high - end manufacturing enterprise in Zhejiang Province. The enterprise is mainly engaged in the R & D and production in the fields of integrated circuit packaging and testing. Therefore, the demand for mid - to - high - end technical and skilled talents is increasing day by day, and the number of employees required is large. According to the characteristics of the enterprise and its employment needs, the enterprise believes that the traditional talent recruitment method is difficult to meet the company's precise talent requirements. Therefore, it hopes to cooperate with local universities to carry out new apprenticeship systems, order - based classes and other models, so as to tailor - make technical and skilled talents for the company, ensuring that the cultivated talents can better meet the company's development needs and enhance the core competitiveness of the enterprise.

2.3. Talent Cultivation Goals of Colleges and Universities

The School of Intelligent Manufacturing of Zhejiang Dongfang Vocational and Technical College is one of the important schools of the college. It mainly includes relevant majors such as electrical automation technology, intelligent manufacturing equipment technology, intelligent control technology, new energy equipment technology, and industrial design. At the same time, the school also has many national, provincial, and municipal - level important platforms and laboratories.

2.3.1. Representative Training Bases Include:

(1) The South Zhejiang Digital Intelligent Manufacturing High - Skilled Talent Public Training Base: This base is led by the Management Committee of Wenzhou High - tech Zone (Economic Development Zone), and jointly built by Zhejiang Dongfang Vocational and Technical College and Zhejiang Yutai Group through a government - school - enterprise cooperation model. It is operated and managed by Wenzhou Yintian Digital Intelligence Skilled Talent Public Training Base Co., Ltd., a state - owned - controlled mixed - ownership enterprise. The base has a mechanical manufacturing training and examination center, an intelligent control technology training and examination center, an intelligent manufacturing training and examination center, and an industrial design and software licensing examination center.

(2) The Labor Practice Base for Primary and Secondary School Students in Zhejiang Province (the Second Batch) and the Vocational Experience Base: It belongs to the intelligent manufacturing labor practice base of the equipment manufacturing category, providing

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vocational experience for students of different ages in primary, junior high, and senior high schools.

2.3.2. Scientific Research and Innovation Platforms:

(1) Wenzhou Key Laboratory of Intelligent Polishing Equipment Technology.

(2) The Intelligent Polishing Equipment Technology Collaborative Innovation Center of Zhejiang Dongfang Vocational and Technical College: With the basic structure of "one institute, two centers, and three fields", and aiming at the three major tasks of "discipline construction (realizing the upgrading of majors to undergraduate level), talent cultivation (cultivating on - site engineers), and key technologies (leading the development of the industry)", it targets the three technical fields of machine vision, robots, and industrial control required by high - end manufacturing.

2.3.3. International Cooperation Platforms:

(1) The Vocational Education Standard and Resource Construction Base of the Ministry of Education of Thailand (Intelligent Manufacturing Equipment Technology Major): It is the first project of the China - Thailand 210 Project for standard and resource construction base. Relying on the platform of the China - Thailand New Energy Silk Road College, it promotes the construction of professional and curriculum resources for intelligent manufacturing equipment technology, develops digital resources, and builds a mobile learning platform to promote the use of courses.

(2) The China - Thailand Vocational Education Standard and Resource Construction Research Center: It is jointly built by Zhejiang Dongfang Vocational and Technical College and Samut Sakhon Technical College in Thailand, promoting educational exchanges and cooperation between the two sides in the fields of intelligent equipment manufacturing and other fields, and improving the educational level and talent cultivation quality of related majors.

3. Construction Content of the Enterprise New Apprenticeship Employment and Internship Base

3.1. Base Training Plan and Curriculum Construction

3.1.1. Dynamic Curriculum System Development

(1) Construction of Job Competency Maps: The school and the enterprise jointly carry out job research, draw the competency matrices of jobs such as integrated circuit packaging and intelligent equipment operation and maintenance, and clarify the requirements for core skills (such as precision instrument operation, process parameter optimization) and professional qualities (such as quality awareness, safety regulations) [5].

(2) Modular Curriculum Design: The training content is divided into basic skill modules (such as mechanical drawing reading, electrical engineering basics), professional technology modules (such as semiconductor material properties, industrial robot programming), and comprehensive practice modules (such as production line fault diagnosis, process improvement projects). Students can choose and combine according to job requirements.

(3) Digital Resource Development: Build a VR virtual simulation training platform to simulate the operation scenarios of high - precision equipment (such as the wire - bonding process in semiconductor packaging), and develop supporting digital teaching resources such as micro - lesson videos and 3D animations to achieve a blended learning model of "online preview + offline practical operation".

3.1.2. Construction of School - Enterprise Dual - Element Faculty Team

(1) Dual - Tutor System: Enterprise technical backbones (such as engineers, process supervisors) and school teachers jointly form a teaching team. Enterprise tutors are

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responsible for practical operation guidance (accounting for ≥60%), and school teachers are responsible for building the theoretical system.

(2) Teacher Competency Improvement: Regularly organize teachers to practice in enterprises (such as participating in technical transformation projects), obtain industry certifications (such as industrial robot operators, intelligent manufacturing system integrators), and increase the proportion of "dual - qualified" teachers to over 80%.

3.1.3. Connection with Industry Certifications

Connect the training courses with national vocational standards (such as integrated circuit engineering technicians, intelligent manufacturing engineering technicians) and enterprise internal certifications (such as Siemens industrial certifications). Students can obtain academic certificates, vocational qualification certificates, and enterprise skill level certificates upon graduation.

3.2. Training Base Construction

3.2.1. Construction of an Intelligent Training Environment

Equipment Upgrades: Equip with advanced equipment such as industrial robot workstations, intelligent production lines, and digital twin systems (such as an automated production line equipped with a Siemens S7 - 1200 PLC control system) to simulate real - world production processes.

Function Zoning: Zone according to the production process.

Basic Skills Area: Conduct basic training in mechanical processing, electrical and electronic technology, etc.;

Professional Technology Area: Focus on the operation of intelligent manufacturing units and industrial Internet platforms;

Innovation and Practice Area: Support students to participate in technological innovation projects (such as designing an energy - saving packaging process plan).

3.2.2. School - Enterprise Co - construction and Sharing Mechanism

(1) Equipment Sharing: The enterprise provides production equipment (such as idle semiconductor packaging machines) for training, and the school maintains and repairs it according to enterprise standards, reducing the idle cost of enterprise equipment.

(2) Site Co - construction: Set up a "teaching factory" in the enterprise workshop, and students directly participate in actual production tasks (such as electronic product assembly) to achieve "alternation of work and study".

3.2.3. Enterprise - style Operation Management

(1) Introduction of 6S Management: The training base implements the enterprise "Sort, Set in Order, Shine, Standardize, Sustain, Safety" management system to cultivate students' professional habits.

(2) Project - based Teaching: Take real enterprise orders (such as the packaging of a certain type of circuit board) as teaching projects, and students complete the whole process from process design to product inspection in groups.

3.3. Employee Skill Training and Student Internship Arrangements

3.3.1. Hierarchical and Classified Training Model

(1) Pre - job Training for New Employees: For employees with 0 - 1 year of experience, set up courses of "basic skills + corporate culture" (such as safety regulations in the semiconductor industry, corporate development history), with a training period of 3 months.

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(2) Training for the Improvement of Technical Backbones: For employees with more than 3 years of experience, offer advanced courses such as "Frontiers of Intelligent Manufacturing Technology" and "Practice of Industry 4.0", with a training period of 6 months.

(3) Customized Training for Order - based Classes: Jointly set up "YSIT Electronics Class", "Mitsubishi Elevator Class" with the enterprise, and the course content is 100% matched with enterprise job requirements.

3.3.2. Internship - Employment Connection Mechanism

A three - stage internship of "shadowing - taking - over - employment" - Shadowing internship (1 month): Get familiar with the job process - Taking - over internship (3 months): Independently complete production tasks - Sign for employment directly after passing the assessment.

3.3.3. Quality Monitoring and Continuous Improvement

(1) Process - based Evaluation: Adopt a comprehensive assessment model of "enterprise tutor score (60%) + school teacher score (40%)" to provide real - time feedback on learning effects.

(2) Dynamic Adjustment Mechanism: Hold a school - enterprise joint meeting every semester. According to enterprise technical upgrades (such as the introduction of an AI quality inspection system) and students' feedback, update the course content and training projects.

3.4. Innovative Measures and Feature Highlights

(1) "Skill Bank" Point System: Students' training achievements can be exchanged for credits, supporting cross - enterprise and cross - region certification.

(2) Integration of "1 + X" Certificates: Embed vocational skill level certificates (such as industrial robot operation) into the curriculum system to achieve "integration of courses and certificates".

(3) Extension of Social Responsibility: Open training resources to small and medium - sized enterprises in the region, provide employee skill improvement services, and help local industrial upgrading.

3.5. Guarantee Mechanisms

(1) Policy Support: Actively apply for national industry - education integrated enterprises and provincial high - skilled talent training bases to strive for special subsidies.

(3) Financial Guarantee: The school and the enterprise share the base construction costs in a 1:1 ratio, and explore a diversified financing model of "government subsidies + enterprise investment+student payment".

(3) Risk Prevention and Control: Purchase work - related injury insurance for interns, and sign a tripartite agreement among the school, the enterprise, and the students to clarify the boundaries of rights and responsibilities.

4. Project Expected Goals

4.1. Promote the Organic Linkage between Employment and Cultivation

By building an employment and internship base, an effective connection between the talent cultivation of colleges and universities and the employment needs of enterprises can be achieved. During the internship process, students can better understand the enterprise's working environment and job requirements, adapt to the workplace in advance, and improve their employment competitiveness. At the same time, enterprises can also select talents that meet their own needs, achieving accurate matching of talent supply and demand.

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4.2. Cultivate Practical, Composite, and In - Demand Technical and Skilled Talents

According to the actual needs of enterprises, the school and the enterprise cooperate to jointly develop personalized talent cultivation plans. In addition to setting up general professional knowledge, the cultivation plan also organically integrates the professional knowledge and practical training content required for the related work of the school - enterprise cooperation enterprise. Therefore, such a talent cultivation plan has strong pertinence and zero - distance connection, cultivating practical talents with solid professional knowledge and practical skills. Through cross - professional curriculum settings and practical project training, students' comprehensive qualities and innovation abilities are cultivated, making them composite talents. In response to the demand for in - demand talents in the industry, key cultivation of talents in related professional fields is carried out to meet the development needs of enterprises and the industry.

4.3. Improve the Technical Abilities and Comprehensive Qualities of Enterprise Employees

School - enterprise cooperation can not only cultivate technical and skilled talents in vocational colleges, providing good internship and training opportunities for vocational college students, but also the colleges and universities participating in the cooperation can feed back to the cooperative enterprises, providing skill improvement training for enterprise employees, helping employees master new knowledge and new technologies, and improving work efficiency and quality. Through training and practice, employees' professional qualities and team cooperation abilities are improved, promoting the overall competitiveness of the enterprise.

5. Project Implementation Process and Results

5.1. Project Implementation Process

During the project implementation process, the school and the enterprise cooperated closely. The school selected excellent teachers to participate in the development of training plans and courses, and the enterprise arranged experienced technical backbones to serve as internship tutors. The construction of the training base was carried out in an orderly manner as planned, and the equipment was installed, debugged, and put into use. The employee skill training and student internship work were carried out smoothly, and the students achieved good learning results in practice.

5.2. Project Results

Through the base training, the skill levels of enterprise employees have been significantly improved, work efficiency has been enhanced, and product quality has been guaranteed. The students in the order - based classes performed outstandingly during the internship process, and were highly recognized by the enterprise. Some students directly stayed in the enterprise for employment after graduation. The teaching quality of the school has also been improved, and the professional construction is more closely combined with enterprise needs, accumulating valuable experience for future talent cultivation.

6. Conclusion

The construction of enterprise new apprenticeship employment and internship bases through school-enterprise cooperation is of far-reaching significance. The cooperation between Zhejiang Dongfang Vocational and Technical College and YSIT Electronics has provided an effective example for cultivating technical and skilled talents in electrical automation and

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promoting employment. In the future, such cooperation should be continuously deepened. We need to constantly optimize the construction content of the bases and the talent cultivation model, strengthen the guarantee mechanism, and encourage more vocational colleges and enterprises to collaborate. This will achieve the in-depth integration of talent cultivation and industrial demands, supply more high-quality technical and skilled talents for society, and contribute to industrial upgrading and high-quality economic development.

Fund Project

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