

# Industrial Talent Training Mode of Higher Vocational Education Under the Background of Forestry Engineering

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## **Abstract:**

New engineering of higher vocational technology is an important subject of higher vocational education, and it is also one of the core of manufacturing talents training in of forestry engineering. This subject has the characteristics of broad, forward-looking, cross, open and practical. Under the background of new technology, new industry, new format and new mode, the new engineering professional training mode and professional construction put forward new challenges. The focus should be on the boundary between major and curriculum, redesign and curriculum reconstruction. In this paper, under the background of "new engineering", the status and role of Engineering Education in vocational colleges are studied. This paper puts forward a new education concept and talent training mode, and makes a preliminary discussion on the interdisciplinary development system of education and teaching quality evaluation. This paper puts forward its own ideas and views, and puts forward suggestions and Countermeasures for cultivating "new engineering" talents with innovation and entrepreneurship consciousness, digital thinking and cross-border integration ability, and provides intellectual and talent support for the future.

**Keywords:** *New engineering, forestry engineering, higher vocational education, manufacturing, engineering technology.*

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## I. INTRODUCTION

In the 21st century, with the advent of knowledge economy, the development of high and new technology, the transition of economic system and the change of industrial structure, all walks of life need more and more high-quality applied and skilled senior practical talents who are directly engaged in the front line of production, technology, management and service [1-2]. If we want to take the road of industrialization and modernization with Chinese characteristics,

we must give full consideration to the special national conditions of China's large number and poor quality of labor force. We need to develop not only capital and technology intensive industries, but also labor-intensive industries; It needs not only tens of millions of professionals, but also hundreds of millions of high-quality workers [3]. The low quality and shortage of Vocational and technical personnel is one of the bottlenecks of the healthy and rapid development of China's economic construction. How to transform the rich population resources into rich human resources is an urgent problem for higher vocational education.

Since China's accession to the world trade organization, it has a broader development space and a world economic stage. However, education is the key to China's long-term sustainable development. Through the vigorous development of education, on the one hand, we can cultivate a large number of high-end talents and strive to be a world leader in many disciplines; On the other hand, it can cultivate an excellent and high-quality labor force that can quickly transform the achievements of science and technology into productive forces. The cultivation of these talents should be completed by vocational education. However, there is a prominent contradiction between the current situation of higher vocational talents training and the demand for professional talents, which is mainly reflected in the following aspects:

#### 1. Inaccurate orientation of training objectives.

At present, China has set up more than 1000 higher vocational and technical colleges through adjustment, reform and merger. However, most vocational colleges have the same problems in the training of vocational talents. Practical skills training can not meet the requirements of the actual job; Practical ability is not strong. This is not in line with the characteristics of vocational education and the competitive advantage of vocational talents [4-6]. There are subjective and objective factors for the emergence of the problems: first, the lack of school conditions, the lack of necessary experimental and internship equipment and methods, and the students seldom have the opportunity to carry out practical training during their study in school; Second, the unclear orientation of colleges and universities and the inaccurate grasp of their own development characteristics lead to the incompatibility between the traditional higher vocational education system centered on teaching materials and teaching methods and the training objectives of talents, which deviates from the requirements of enterprises for the cultivation of high-quality skilled talents.

#### 2. The training level lags behind.

With the active economic construction and the increase of the share of high-tech industry, the requirements of enterprises for various types and levels of talents in vocational education

are constantly changing. Higher vocational talents training should comply with the changes of human capital demand of industry and industry, and carry out the changes of talents training level, specialty setting and other related objectives and measures. But the reality of vocational education is not so, the existing vocational education resources are still in a low level of development stage, the school level is low. The scale of secondary vocational schools accounts for more than 90% of the total vocational education, while the proportion of higher vocational colleges is extremely unbalanced, which makes the contradiction between the supply of senior vocational and technical talents and the demand for talents in the rapid development of economic production more prominent. On the one hand, there is a serious shortage of senior vocational and technical personnel, and on the other hand, a large number of general vocational and technical personnel can not get good employment due to various reasons. Conceptual diagram of I2I talent training mode is shown in Figure 1.



Fig 1: Conceptual diagram of I2I talent training mode

### 3. The contradiction between supply and demand is prominent.

The Ministry of labor and social security has conducted a field survey in Guangdong, Fujian and Zhejiang Province. Based on the questionnaire survey of skilled talents in 40 cities and the analysis of labor market supply and demand in 113 cities, the following conclusions are drawn: the shortage of skilled workers, especially high skilled talents, is widespread throughout the country, especially in developed manufacturing areas, It has been unable to meet the needs of economic development. According to the statistical data in 2001, there are 11.64 million students in secondary vocational schools and 386 independent higher vocational and technical colleges, with only 720000 students [7]. As of September 1, 2002, there were more than 1.3

million students in private non academic institutions. Therefore, it is not difficult to see: compared with the huge market demand for Vocational and technical talents, there is still a large gap in the supply of vocational college graduates. With the further development of various forms of vocational training, hundreds of millions of urban and rural workers are trained every year, which has significantly improved the quality of Chinese workers.

## **II. INVESTIGATION AND ANALYSIS ON THE DEMAND AND CULTIVATION OF VOCATIONAL AND TECHNICAL TALENTS**

The skill demand of enterprises for Vocational and technical talents mainly focuses on the comprehensive quality, basic vocational skills, professional skills and the connection between supply and demand. Through this survey, we can understand the similarities and differences of different enterprises' demand for Vocational and technical talents.

### **1. Comprehensive quality.**

On the demand of comprehensive quality, enterprises pay special attention to professionalism, work attitude, discipline and honesty. Because the construction of this aspect is an important part of the enterprise, for a long time, the enterprise attaches great importance to the professional dedication, discipline and integrity construction of technical personnel, which is also one of the key points for enterprises and employees to participate in the construction of a socialist harmonious society. Through the articles of association and corporate culture tabloids, Guangdong Longji group attaches great importance to promoting and guiding the improvement of employees' comprehensive quality [8]. With the deepening of China's economic system reform, domestic enterprises continue to adapt to the requirements of economic globalization and the acceleration of scientific and technological progress, and actively promote the construction of enterprise integrity. Through unremitting efforts, the level of integrity has been greatly improved. Most enterprises put the dedication and integrity of employees into their development strategy. Li Hongwei, general manager of UFIDA, believes that college students should improve their professional quality from three aspects: character, ability and attitude, so as to lay a good foundation for them to become talents welcomed by enterprises and obtain employment smoothly [9]. Among the surveyed enterprises, 98% of them regard this as their core values, and 95% of them consider it as an important strategic matter, which is one of the decisive factors to improve the sustainable development of enterprises. A design process for teaching system is shown in Figure 2.

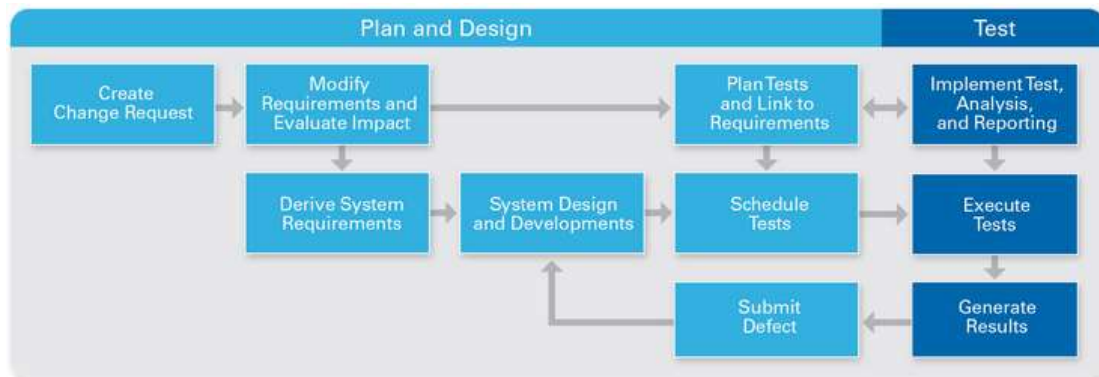


Fig 2: A design process for teaching system

In fact, what employers care about is not only the ability of talents, but also whether they are trustworthy. When an enterprise hands over its assets and technology to him, will he help the enterprise win an advantage in the ever-changing market environment, or will he be greedy for profits and use them for himself? This depends on the professional ethics level of technical personnel and their loyalty to the enterprise. A loyal and incompetent employee will not play a role in the development of the enterprise. However, a competent but disloyal employee may cause great harm to the development of the enterprise. For example, divulging trade secrets; Intentionally missing business opportunities; Misleading enterprise leaders to make major decisions. Even if there is no immoral behavior, these people will leave the enterprise because of their lack of loyalty to the enterprise, resulting in brain drain. Most of the enterprises set the goal of integrity construction. Among the enterprises surveyed, 83% of them have established or are in the process of establishing the code of conduct for employees' integrity; 64% of the enterprises have a clear goal of building integrity, of which 91% are state-owned enterprises and multinational enterprises. Most enterprises have set up relevant management departments. Among the enterprises surveyed, 72% have set up part-time or special management departments, which are usually in charge of the administrative department, human resources department, public relations department, etc.

## 2. Basic skills.

Basic skills are one of the projects that enterprises pay attention to in recruitment. In this survey, up to 95% of enterprises put computer application skills as the first choice of basic skills. Enterprises think that "the ability to use computers is conducive to the management and development of enterprises", and enterprises with large scale, strong corporate culture atmosphere and management norms have higher requirements; However, small-scale and pure processing enterprises have lower requirements and do not make general requirements.

### 3. Professional skills.

In terms of the demand for professional skills of talents, the requirements for assembly line staff of enterprises with large-scale and simple repetitive production are operation and practice ability, professional theoretical knowledge, vocational and technical qualification certificate, etc; However, enterprises with relatively flexible production characteristics, such as mechanical installation and electronic parts production, generally require the ability to work independently and solve problems, professional theoretical knowledge, operation and practical ability. In large-scale state-owned and state-owned holding enterprises, foreign-funded enterprises and enterprises invested by Hong Kong, Macao and Taiwan, they generally pay more attention to the level and rationality of the intellectual composition of talents. The cultural structure of talents above the management level is dominated by undergraduates. The technical workers in the production line are selected with better comprehensive quality and ability Higher vocational and technical talents from vocational schools with good school running reputation; The private enterprises should first emphasize the comprehensive quality and practical ability of the front-line technical workers; Under certain conditions, education and vocational and technical qualification certificates are the stepping stones for employees to enter the enterprise. In this survey, 70% of enterprises think that vocational and technical qualification certificate is one of the factors considered by enterprises under the same conditions, which requires our vocational education to attach importance to students' diplomas and treat the acquisition of Vocational and technical qualification certificate as a relatively big thing in the teaching process. When asked about the main views on the skill needs of the current vocational and technical talents, the interviewed enterprises generally feel that among the current vocational and technical talents, there are not many talents who can be down-to-earth, seriously and responsibly start from the grass-roots level, and those who are dedicated, practical and willing to work are very valuable and highly valued. Most of the graduates have weak professional knowledge and low professional ethics.

### 4. Connection between supply and demand.

It is learned from the survey that many enterprises reflect that college students are often unable to correctly evaluate themselves and are unwilling to start from the grass-roots level. They generally have the mentality of becoming clerks or administrators. Therefore, job hopping is very common and can not sink down. It can also be said that there is a gap between the actual needs of enterprises and the wishes of graduates. Wholly foreign-owned enterprises and joint ventures generally have large scale, standardized management and good working atmosphere. The adaptability of professional and technical personnel is relatively higher than that of private

enterprises, with low turnover rate and relatively stable personnel. It is 95% of the enterprises surveyed that the professional and technical personnel are more stable in a job. Only 87% of enterprises think that reasonable salary, all kinds of insurance, and good promotion system are the main ways to attract professional and technical talents.

From the survey found that the school is the main channel for enterprises to recruit technical personnel. In the recruitment of Vocational and technical talents, 80% of enterprises choose to recruit or recruit students from vocational and technical schools directly; 20% of them choose to recruit from the society. In addition, there are other ways such as training the original employees. Among all the enterprises surveyed, 65% of them have or have had the experience of cooperating with fixed vocational and technical schools, and usually contact with schools when students graduate, and directly introduce a large number of qualified talents; Enterprises that have not participated in the joint training of students with schools usually obtain the required talents by means of double selection in the talent market. In this survey, we found that although most of the vocational and technical personnel in enterprises are recruited from schools, they are not satisfied with the skills of Vocational and technical personnel trained by schools, and the contradiction between "learning and using" is prominent.

The human resources ministers of many enterprises mentioned that the expectation of the skills and professional knowledge developed by the school is not high, because from the current recruitment of students, the professional knowledge learned and mastered by the enterprises are obviously outdated and lag behind the technical requirements of the enterprises, At present, enterprises need to gain a foothold in the market, and most of them apply the latest technology and constantly innovate in order to be competitive in product and quality. The head of Human Resources Department of today group even pointed out that the knowledge learned by school students is the teacher's practical theoretical experience. After four years of study in the University, they pass three or four years of teaching to students, At least seven to eight years behind the times. For example, in the survey of school internship strength, 80% of enterprises think that the strength and degree of learning is not enough, and 20% of enterprises think that it is far from enough, that is to say, in order to improve the satisfaction of enterprises, schools must increase the strength of students' internship. Schools must improve their service awareness and cultivate talents according to the needs of enterprises. If some schools can't cultivate qualified talents for enterprises for a long time, it is extremely unfavorable for the development of schools [10]. At the same time, enterprises can't obtain the talents necessary for development, which is bound to hinder the development of enterprises.

The survey also shows that the phenomenon that the society does not agree with higher vocational education is still serious. There are still many deviations in the understanding of higher vocational colleges. At the job fairs in many areas, some employers declared that

"graduates of higher vocational colleges are free to talk about" and implemented "high consumption" of talents. At the meeting of supply and demand, many enterprises are required to recruit technical personnel with "college degree or above", but they are required to hand over the jobs that vocational students are competent for to undergraduates and postgraduates. This situation not only has the side that higher vocational colleges do not adapt to the demand, but also has the influence of the current personnel management system, employment system, enterprise itself and other factors. And the reality is: all industries (grass-roots) need a large number of new workers with practical skills, and a large number of higher vocational college graduates can not find suitable jobs to play their role. In the survey, the demand of enterprises for the cultural level of Vocational and technical talents is mainly secondary vocational and technical talents. Among the first-line vocational and technical talents, 80% of the employees have technical secondary school education, and only 15% have college education. These very intuitive data can show that the enterprise needs for professional and technical personnel in the level of understanding error. It is hoped that the functional departments of the government will take measures to guide, cherish talents and select talents according to their abilities.

### **III. CONCEPTION OF HIGHER VOCATIONAL TALENTS TRAINING MODE UNDER THE BACKGROUND OF NEW ENGINEERING**

#### **3.1 Post training mode of enterprises**

The so-called enterprise post training means that when there is a vacancy, the enterprise will choose the relevant training institutions to train the employees. The training content directly aims at the requirements of the enterprise's own post theoretical knowledge and operation skills, which can directly meet the needs of enterprise production. Professor Yan Chengzhong, a Chinese economist, said: "enterprise staff training consists of a series of planned projects, which are important measures and ways to improve employees' knowledge, skills, attitude, social behavior and even personality, so as to achieve the obvious purpose of improving organizational efficiency and benefits."

#### **Case 1: Haier characteristic training**

When employees enter Haier, the principle of training work is "learn what they do, make up what they lack, learn what they need first, and get instant results". On this premise, the first is the training of values, "what is right, what is wrong, what should be done, what should not be done", which is the first clear content of every employee in the work, which is also the content of corporate culture. As for the training of corporate culture, in addition to taking "Haier people" newspaper, "Haier news" and "Haier corporate culture manual" as carriers, the group



carries out vigorous publicity, and plays an exemplary role through up and down communication, the important thing is to conduct interactive training. At present, Haier has carried out a variety of cultural atmosphere construction in employee culture training, such as organizing employees to annotate Haier's concept through lantern riddles, artistic performances, sports competitions, etc., and experiencing the happiness of being a member of Haier family. Skill training is the focus of Haier's training work. Haier's skill training focuses on the "real-time training" mode through cases. Specifically, it is to grasp the cases (the best deeds or the worst deeds) that appear at any time in the actual work, analyze the cases on the spot immediately after the shift on the same day, unify the actions, concepts and skills of the personnel according to the problems or patterns reflected in the cases, and then carry out training and learning in the area in the form of on-site kanban, And through refining in the group's internal newspaper "Haier people" for public publication, discussion, to form a consensus.

The specific process includes two stages: one is the training stage, aiming at a specific problem, showing the true background to the employees receiving the training, providing a lot of background information. The participants analyze the problems according to the background materials, put forward the methods to solve the problems, and then publish the actual methods, so as to improve the employees' ability of analyzing and solving problems through comparison and explanation; Second, in the follow-up follow-up inspection stage, the enterprise has a follow-up inspection record for the trained employees to confirm whether the employees really master the essentials. For the employees who do not meet the requirements, the enterprise will retrain them. Employees can learn from the case analysis, problem-solving ideas and ideas, improve the skills of employees, this training method has been fully implemented in the group. For managers, in addition to case training, the training is supplemented by the regular meeting on the 8th of each month, daily clearing meeting, professional regular meeting and other opportunities. Haier has a unique understanding of the application value of this kind of teaching, and believes that its main function is not to sum up a unique experience, but to sum up a set of analysis methods suitable for the characteristics of the enterprise or to accept the overall cultural concept of the enterprise in their own exploration and mutual consultation.

#### Case 2: Training of Sany Heavy Industry Co., Ltd

At the beginning of its establishment, Sany Heavy Industry positioned itself as a social enterprise. The author thinks that the enterprise is the enterprise of the society after all, not the enterprise of a certain person or a certain family. No one or any family can take her away easily, but they all have the responsibility to do her well. As of February 28, 2006, the total number of the company is 5350. Among them: 2272 production personnel, accounting for 42.5%; There

were 765 salesmen, accounting for 14.3%; 291 R & D personnel, accounting for 5.4%; There were 5 doctors, accounting for 0.1%; 78 people had master's degree, accounting for 1.5%; There were 1221 undergraduates, accounting for 22.8%; 1451 (27.1%) had college degree; There are 1038 technical secondary school graduates, accounting for 19.4%. The enterprise has unique training concept, resources and management. Dominance scale value table is shown in Table 1. The experiment result is shown in Table 2.

**TABLE I. Dominance scale value table**

<b>SCAL E</b>	<b>REPRESENTATIVE MEANING</b>
1	Factor i is as important as factor J
3	i factor is slightly more important than J factor
5	i factor is more important than J factor
7	The ratio of i factor to J factor is very important
9	i factor is more important than J factor
2,4,6,8	Scale values corresponding to the above intermediate states

**TABLE II. The experiment result**

<b>C<sub>I</sub></b>	<b>C<sub>1</sub>...C<sub>N</sub></b>	<b>NORMALIZED EIGENVECTOR</b>
C <sub>1</sub>	Judgment matrix	a <sub>1i</sub>
C <sub>n</sub>		a <sub>ni</sub>

Through the investigation, we know that the enterprise independent training mode has the following characteristics:

(1) It is simple, flat and fast. If the graduates recruited by enterprises from vocational colleges want to master the necessary skills and understanding ability, most of them need to be retrained by enterprises during the transition from students to employees. This is mainly reflected in the enterprise for this kind of personnel training cost less, short time. Enterprises with a certain scale generally have relevant training institutions, and new employees are trained by training institutions. After the relevant training, employees learn the corresponding work skills, work procedures and corporate culture indoctrination, system requirements, personnel can be familiar with the work of the enterprise, can quickly start, direct learning to apply. Or in the small-scale enterprise through the master with apprentice form to train talents, there is no

doubt that this training method can save a lot of money for the enterprise, and learning by doing is a very useful training method. It is undeniable that the current talent training mode is conducive to alleviate the plight of the lack of technical personnel in enterprises. The goal of training is simple, easy to use, effective and durable basic operating skills.

(2) According to the view of "talent development needs investment", enterprises should introduce, train and use personnel to the maximum extent according to the actual situation of enterprises and personnel cost accounting. Enterprises are often training talents for relevant positions, which makes the training of employees very targeted. From the perspective of special human capital, every new job for employees needs a process of training and learning in order to be proficient and competent. As an organization pursuing the maximization of economic benefits, the enterprise must consider the ratio between cost and benefit. According to the division of labor within the enterprise, the new employees should first determine their type of work. The division of labor enables them to be specialized in one line rather than comprehensive training, so as to avoid repeatedly spending unnecessary training costs on one person, so that the enterprise can save training costs. Selecting internal staff for training, the new position of staff after the training is bound to give more play to their strengths than the original position, which will stimulate the staff to work hard in the existing position to strive for training opportunities.

### 3.2 order training mode

In the case that the school training can not meet the needs of enterprises, enterprises turn to self-cultivation of Vocational and technical personnel, but this brings another problem. The vocational and technical personnel trained by enterprises are only simple operational talents, lack of systematic learning of vocational knowledge and theoretical knowledge. In this case, to meet the needs of enterprises, we must find a new way to directly combine the teaching process with the technical posts of enterprises. Schools must seek the support of enterprises and run schools jointly, which calls for a demand-oriented "order" talent training strategy. The so-called "order type" talent training mode refers to that higher vocational colleges as the training party and enterprises and institutions as the employing party jointly formulate talent training plans according to social and market demands, sign employment orders, cooperate in teachers, technology, school running conditions, etc., and teach in schools and employing units respectively through "work study alternation", It is a kind of talent training mode of combination of production, study and research that students directly go to the employing unit for employment after graduation. It is an image of the education mode of combination of production, study and research, and it is also one of the most typical forms of combination of production, study and research. Its basic elements include order (cooperative training

agreement), training plan, operation mechanism, work study alternation, post work (with time requirement, paid labor), employment, etc“ The "order type" talent training mode especially emphasizes the key role of "order" in it. Its essence is to close the relationship between the school and the employing unit through the form of signing cooperative "order" between the school and the enterprise, so as to realize the organic combination of production, teaching and scientific research, and fundamentally solve the vocational problems of students' learning in school The problems of technology application and employment directly serve the local economic construction. Therefore, in a larger sense, as long as the employer and the school sign an "employment order", it can be regarded as an "order" talent training mode. For the education side, setting up a school should consider the industry background, determining the major should also consider the industry background, and the school should accurately position according to the actual needs. For the enterprise, on the premise of putting forward the demand, it must also participate in the determination of talent specifications, the formulation of curriculum plans and the formulation of evaluation standards.

## V. CONCLUSION

In the 21st century, with the advent of knowledge economy, the development of high and new technology, the transition of economic system and the change of industrial structure, all walks of life need more and more high-quality applied, technical and skilled senior practical talents who are directly engaged in the front line of production, technology, management and service. From the perspective of the market, although China has rich population resources, a situation that can not be ignored is that the overall quality of the domestic labor force is low, lack of high-quality vocational and technical personnel, how to transform China's heavy population burden into a strong advantage of human resources. This has brought new opportunities and challenges for the development of higher vocational education, which is responsible for this kind of personnel training task.

From the perspective of economic supply and demand, standing at the height of strategic management theory, relying on the talent training mode theory of pedagogy and human capital theory, this paper focuses on the effective cooperation between the demand of enterprise skilled talents and the supply of Higher Vocational and technical talents, and studies the Countermeasures of Higher Vocational and technical talents training under the demand of enterprise skills. In the past, the problems of technical personnel training in higher vocational colleges are almost discussed and studied from the perspective of pedagogy. The biggest innovation of this paper lies in the use of management methods (literature research method, questionnaire survey method, case analysis method) and theories (strategic management theory and human capital theory, etc.) to analyze the gap between enterprise skill demand and

vocational students' skill supply, and put forward suggestions on the reform and development of talent training mode in vocational colleges.

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