

## Strategies to Improve the Self-learning Abilities of Higher Vocational Talents through Research-based Teaching

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**Keywords:** research-based teaching; cultivation of self-learning ability; modern apprenticeship; cultivation of higher vocational talents

**Abstract:** Through comparative study, this paper analyzes the employment and development of graduates of Dalian Vocational and Technical College, reflects on whether higher vocational talents need to have the self-learning ability, and puts forward corresponding strategies to cultivate that ability in the implementation process. The mutual coordination and organic development of research-based teaching and the self-learning and self-working abilities are observed and studied from various perspectives.

### 1. Introduction

Research-based teaching is a kind of teaching mode. In the process of teaching, a situation and a method are created. That process includes lead in questions which serve for the teaching task. In the classroom, teachers should introduce problems which can cultivate students' initiative to explore and think, or encourage students to practice on their own initiative, so as to improve students' comprehensive quality and cultivate their autonomous learning ability. It is a cultivation method which facilitates the innovative research. Research-based teaching is not a new teaching method. But the procedure of rediscovering its connotation and refining its essence, and then combining it with the process of cultivating students' abilities, is one of the innovative methods which can adapt to the development trend of higher vocational education. Taking the hot topic of modern apprenticeship as the background, this paper chooses the specific index of "ability goal" cultivation in the connotation of modern apprenticeship to analyze the connotation of apprenticeship. It is found that at this stage, students' self-learning ability can guarantee they have the capacities of high-skilled applied talents required by enterprises. Therefore, the basic teaching methods should be adjusted to ensure students have scientific thinking methods and the ability of sustainable professional development. In modern apprenticeship, the subjects of training are enterprises and schools. As the part of training and teaching, schools should teach students about knowledge and skills. Students are the recipients. Only when students have good autonomous learning ability and there are smooth knowledge dissemination channels, can the training and education achieve good results. In higher vocational colleges, teachers can learn the scene elements from the apprenticeship system of actual workplace, refer to enterprises' job requirements, trying to meet the requirements of teaching syllabus and apply research-based teaching methods and implementation principles to the education process, so as to cultivate talents that can meet the requirements and training objectives of the modern apprenticeship system. Through improving the autonomous learning abilities of higher vocational students, schools can ultimately achieve the training goals required by the connotation of modern apprenticeship.

It is feasible to apply research-based teaching to the cultivation of students' autonomous learning ability in higher vocational colleges. The connotation of modern apprenticeship shows that students' autonomous learning ability is essential in their future employment, job transferring and adaptability to the working environment. It is also a necessary quality for the transfer of knowledge and abilities. Enterprises expect employees to have professional qualities which enable them to "adapt to the working environment even though they do not know their future career". It is also of

great practical significance to the cultivation of modern high-skilled talents with various skills and the innovation spirit.

## **2. The Implementation of Research-based Teaching**

### **2.1 Research on teaching objects**

The samples selected in this paper are biotechnology major graduates of Dalian Vocational and Technical College from the five consecutive years of 2011 to 2015. A total of 240 students are selected. Among them, 74 were recruited by Pfizer Pharmaceutical Company (Dalian Company), which is one of the Fortune Global 500 firms; 29 were recruited by Dalian Bao Biopharmaceutical Company; 20 were recruited by local pharmaceutical enterprises; 10 were recruited by Dalian Dazung Pharmaceutical Company. The four enterprises employ 133 students, accounting for 55% of the total graduates. The principle of selecting samples is that, pharmaceutical enterprises are productive employment units. Though domestic and foreign pharmaceutical enterprises have different corporate cultures, they have similarities in terms of professional and technical requirements. Employees hired by them are in higher quality. Students who graduated in the five consecutive years are selected as the research objects of this paper, which illustrates the research-oriented teaching mode can improve the effect of personnel training.

### **2.2 Research on enterprise demand**

Usually, talents from higher vocational colleges are hired by enterprises as industrial workers. Therefore, although many students and parents expect that the school-enterprise platform can provide high-level positions, the actual employment situation is relatively objective and rational. Therefore, the school cannot establish training objectives which blindly cater to parents but ignore the actual employment needs of companies, which will lead to a gap between talents cultivated by schools and employees required by enterprises. According to the ranking of pharmaceutical enterprises in Dalian, the American company Pfizer is better than Japanese enterprises; Japanese corporations are better than local enterprises. The salary provided by these companies also conforms to that order. All enterprises, regardless of the ranking, prefer graduates with relatively high academic performances. They especially like students who have won provincial or municipal awards in industry skill contests during the school period. Employees need to obey the management, and be able to quickly and independently meet the requirements of the position after a period of post training.

Through investigation and research, it is found that the production and marketing of high-skilled talents directly reflect whether the skill level and the training mode of higher vocational colleges can meet the requirements of enterprises in the current employment market. Through analyzing the current situation of students and the needs of enterprises, we can broaden the training mode of schools so that students they cultivated can adapt to the rules of market in the fierce competition. According to the selection criteria for ordinary employees and the reserve cadre of more than a dozen of pharmaceutical biotechnology enterprises and more than a dozen of pharmaceutical marketing enterprises in Dalian, it is found that enterprises do not attach much importance to the educational background of graduates, but pay more attention to the ability and competence of students themselves. All enterprises believe that personality is the most important factor. 90% of enterprises attach importance to the sense of post responsibility. They hold that on the basis of doing their own jobs well, employees should also be honest and pragmatic, have the sense of responsibility, and can find problems and analyze reasons to solve problems on the basis of independently accomplish their jobs. 86% of enterprises think that team spirit is very important; "When people work with one mind, they can even remove Mount Taishan". The proverb highlights the importance of team cohesion. All employees, from front-line workers on the assembly line to employees of sales enterprises, should not care too much about personal gains and losses or act on their own wills. They should have a sense of collective honor. In addition to these three aspects of soft qualities, 85% enterprises focus on employees' self-learning abilities. The reasons are, on one

hand, skills they learned in schools lag behind the needs of work; on the other hand, the combination of theory and practice needs a certain process.

### **2.3 Research on classroom teaching**

Through years of teaching experience, it is not difficult to understand that the core of teaching lies in the building of environment. Students can learn the knowledge and cultivate their self-learning abilities in the process of interaction with the environment. Research-based teaching urges students to enter factories, contact with pre-job education trainers and skilled masters. Through a large number of surveys, there are indeed a large number of teaching modes that can be used for reference. Some of them have simple principles and can be used in the situational teaching easily. Some strategies are complex and require teachers to guide students patiently and repeatedly.

### **2.4 Research on practical training teaching**

In order to establish a student-centered teaching model for practical courses, increase students' participation levels in experimental courses, and improve students' abilities of autonomy and self-study as well as their capacities of group cooperation and division of labor, the course Biochemical Testing Technology has carried out the reform of teaching content and the innovation of teaching mode in practical links, with a view to promote the cultivation of students' self-study abilities. The contents of the Biochemical Testing Technology course are improved at first; existing problems are solved. These problems include, the teaching content cannot match with the employment position; testing tasks cannot match with the actual operations in enterprises; the testing procedure and standards are different from the working procedure and standards of enterprises; when come across some testing techniques they have not learned, students cannot complete the work independently through self-learning. We should integrate the needs and requirements of enterprises into the practical teaching reasonably, provide opportunities for students to get in touch with and understand the working methods, tasks, standards, situations, professional backgrounds and development trends of enterprises, and construct a teaching mode with prominent learning focus and strong pertinence, so as to realize the competitive advantages of students in the working environment after graduation.

### **2.5 Research on the training of order class**

Order classes are composed of students pre-hired by large enterprises. Colleges revise teaching plans and organize teaching activities according to the talent training objectives as well as the knowledge and ability structures put forward by enterprises, so as to promote students' employment in a targeted way. The pharmaceutical biotechnology department has organized order classes with Pfizer Pharmaceutical and other large foreign enterprises. Based on the needs of positions and the actual situations of actual work place, new teaching contents and methods are adopted to form a modular talent training program which can meet individualized requirements, so as to strengthen the cultivation of students' ideological, cultural and physical qualities as well as their professional basic knowledge systems. The requirements of vocational posts are the objectives of the curriculum. Working in enterprises is totally different from the practical training inside school. Students are no longer passive and idle, since they have a more distinct role orientation. In the external situation of enterprise production and management, the large environment makes student respect their positions spontaneously and become willing to operate strictly according to standards. For example, in the simplest cleaning process before going to their stations, students strictly behave in accordance with the regulation posted on the wall: changing clothes, wearing aseptic working suits and hats, clearing fingernails, having air shower, and cleaning their work shoes, in order to achieve the goal of not polluting the workplace and not affecting product quality. In the workplace, each student has his own task and there is nobody to spare. Unlike the group experiments in school, students can rely on other members of the same group. In enterprises, they have to do their jobs well; otherwise the production order will be disturbed. In that situation, students' sense of responsibility arises spontaneously. Some students are not satisfied with the knowledge they have acquired in their positions. They learn from their classmates about the situations other positions, and then gradually

understand the natures of all positions, as well as the quality management system, the quality control system and the technical system of the enterprise. They constantly enrich themselves and strive to become excellent employees who can be competent for all jobs. After the internship, enterprises will hire students who understand the rules and are good at learning. Those students who are impetuous and cannot adapt to the environment will be eliminated. In the internal promotion, companies prefer employees who are better at expanding knowledge scopes and have the self-study ability, rather than staffs who are not interested in other positions. The gaps between students' potentials and career development are widening.

### 3. Summary

In modern apprenticeship, the subjects of training are enterprises and schools. As the part of training and teaching, schools should teach students about knowledge and skills. Students are the recipients. Only when students have good autonomous learning ability and there are smooth knowledge dissemination channels, can the training and education achieve good results. In higher vocational colleges, teachers can learn the scene elements from the apprenticeship system of actual workplace, refer to enterprises' job requirements, trying to meet the requirements of teaching syllabus and apply research-based teaching methods and implementation principles to the education process, so as to cultivate talents that can meet the requirements and training objectives of the modern apprenticeship system. Through improving the autonomous learning abilities of higher vocational students, schools can ultimately achieve the training goals required by the connotation of modern apprenticeship.

Through the study of the employment standards of enterprises and the feedback of graduates' working status in internship units, as well as the frequent communication with personnel in the human resources departments of enterprises, it is found that higher vocational colleges should cultivate and improve students' autonomous learning ability. Practice has proved that the self-regulated learning consciousness cultivated at school can be extended to the internship stage. Without that competence, after employment, graduates will be gradually used to low-tech positions and become lazy in thinking in the stable working environment. If they do not form the self-regulated learning consciousness at school, they will not thirst for knowledge and be eager to improve their professional skills. Under that situation, through employees still have high expectations on the salary improvement, the reality cannot meet their expectations.

How to induce students' desire to study independently and improve their self-learning abilities during their study in higher vocational colleges? The main way is that, in the situational education, teachers should use a short amount of time to impart students with the background information and theoretical knowledge, and spend plenty of time to encourage students to study in practice and improve their thinking methods. How to combine the two factors effectively and improve the self-learning abilities of skilled personnel in higher vocational colleges? Teachers can refer to problems reflected in the weekly diaries of interns and set up corresponding teaching focus, namely key and difficult points that need to be paid attention to in the work place. Through the weekly diaries recorded by interns in the first few weeks, we find that at the beginning, these students attach great importance to the work they are going to do. They want to do the job well and record problems carefully. Most problems are technical matters they encounter in the work place. However, many problems are solved in time. With the accumulation of problems, interns fall into their inherent mode of thinking. They fail to transform their expectations for new jobs into the improvement of their professional skills through effective self-learning process. It clearly shows that technical difficulties students experienced should be taught repeatedly in the classroom before internship. Then, with the help of enthusiasm at the early stage of work, the obstacles students are facing can be cleared away immediately. In that process, graduates can form the ability of self-learning during the internship and actively use the ability in the future.

Dalian Vocational and Technical College has carried out the specific personnel training program for last five years. The feedback of graduates' employment show that the self-learning ability can be found in most graduates sampled in this survey. The difference between employees with and

without self-learning abilities grows in their future development. Therefore, the focus of in-depth study on various aspects of talent training has been strengthened. It is necessary to cultivate and improve the self-learning abilities of higher vocational talents, so as to transport professionals and skilled talents for regional economic development, and to ensure that the trained talents can meet the connotation requirements of the modern apprenticeship system.

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