

# Research and Practice on Curriculum Reform of Higher Vocational Undergraduate Taking Pharmaceutical Engineering Principle and Equipment Course as an Example

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**Abstract :** With the continuous reform and development of China's higher vocational and technical education, great changes have taken place in the teaching system of China's higher vocational colleges, and the social demand for vocational and technical talents is increasing. The teaching methods and contents of professional core courses should keep pace with the times, so as to cultivate high-level and new industrial and technical talents. Especially for the pharmaceutical engineering original road and equipment course with strong engineering application type in applied chemistry specialty, we should carry out the research of new methods and the reform of new contents, so as to improve the students' comprehensive quality and corresponding vocational skills. In the process of teaching, we should pay attention to the practicality of the theoretical knowledge of the course, and cultivate students to learn the close organic relationship between the theoretical framework of pharmaceutical engineering principles and equipment course system and the practical application of engineering.

**Keywords :** Higher Vocational Undergraduate; Pharmaceutical Engineering Principles and Equipment; Applied Chemistry; Practicality of Theoretical Knowledge; Senior Technical Personnel

In the core courses of applied chemistry, there are four major courses of chemistry and chemical engineering principles, such as drug synthesis, pharmaceutical unit operation, separation engineering and course design. The corresponding chemical engineering design courses constitute a huge knowledge system of pharmaceutical engineering. First of all, students can master the operating principles of various pharmaceutical process units, be familiar with pharmaceutical separation means, understand pharmaceutical process and pharmaceutical factory process and equipment design in the learning process of this course. In addition, they also need to understand "three wastes" treatment process and environmental protection knowledge, so that students can consciously avoid the occurrence of environmental safety accidents in their future study or work. After the occurrence of environmental safety accidents, we should take the right measures in time to minimize environmental pollution. Secondly, through the corresponding unit operation, it can also improve students' experimental operation skills, cultivate students' strict logical thinking and practical experimental attitude, which is also a basic means to promote the learning of students' professional curriculum theoretical knowledge, in order to cultivate students' understanding and use of drug production principle, pharmaceutical equipment and research ability of drug synthesis route.

## 1. Basic situation of pharmaceutical engineering principle and equipment course

At present, there are two main problems in the teaching process of pharmaceutical engineering principle and equipment course in applied chemistry specialty of higher vocational colleges.

### 1. 1 The way of teaching is single

In the teaching process of pharmaceutical engineering principle and equipment major, the teachers basically interpret the

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doi: 10.18686/ahe.v5i2.3349

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theoretical knowledge according to the textbook. The teachers did not sort out and arrange the course content reasonably, and the knowledge points are very jumping and lack of logic. As a result, the efficiency and quality of the classroom are not high, and the students are not interested in and active in the course content of this major. Therefore, most students cannot make rational and scientific use of the theoretical knowledge in the book after learning the course content, which is a serious obstacle to the cultivation of industrial technicians.

## **1.2 The teaching content is not closely related to the practice**

In the teaching process of pharmaceutical engineering principle and equipment major, the knowledge contained in the course content is different from the practical application of modern pharmaceutical engineering knowledge in the actual operation process to a certain extent. Therefore, if students only learn the theoretical knowledge in the textbook, then they do not have a deep understanding of the specific situation of modern pharmaceutical engineering, which is very important. It is also a serious obstacle to the cultivation of high-level industrial talents and application-oriented technical talents needed by modern society.

## **1.3 Lack of improvement in experimental courses**

The courses related to experiments in applied chemistry include inorganic chemistry, organic chemistry, quantitative analytical chemistry experiments, pharmaceutical engineering principles and equipment, etc. Especially for pharmaceutical engineering principles and equipment experiments, in most cases, students are only required to be familiar with common unit reactions and equipment, or to carry out some specific and limited experimental operations. At the same time, it is more inclined to the unit operation experiment of chemical engineering principles, which is not very helpful for students to learn professional knowledge and engage in the work related to pharmaceutical engineering in the future. Therefore, in view of this situation, teachers need to actively explore and develop an effective experimental teaching mode that can satisfy the pharmaceutical engineering principle and equipment experiment of pharmaceutical specialty students, make students like to do unit operation, and also help students combine theoretical knowledge with practical operation. This is the basic demand of China's social development trend, and it is also applied the course of pharmaceutical engineering principle and equipment experiment is facing a major challenge.

## **2. Teaching reform measures of pharmaceutical engineering principle and equipment course**

According to the problems existing in the teaching process of pharmaceutical engineering principle and equipment specialty at the present stage, and according to the needs of modern society, the reform of teaching content can be carried out

### **2.1 Paying attention to the scientificity of teaching content**

Pharmaceutical engineering principles and equipment as a professional course, teaching should pay attention to the use of certain scientific means to guide students to learn, so that students can understand the real meaning in the process of exploring the theoretical knowledge of pharmaceutical engineering principles and equipment, and prevent students from adding too much subjective thinking; at the same time, scientific knowledge points should be studied and discussed realistically, so as to improve their scientific literacy, to prepare for the future teaching process.

### **2.2 Paying attention to the ideological and political nature of teaching content**

Ideological and political education is an important way to expand the teaching means of vocational education. Integrating ideological and political education into the theory and practice teaching of pharmaceutical engineering principle and equipment can deepen the ideological connotation of teaching, provide theoretical guidance for the development of pharmaceutical engineering principle and equipment teaching of higher vocational undergraduate application specialty, and point out the teaching direction, so as to improve the students' quality while teaching in theory and practice on the basis of national feelings, craftsman spirit and other ideological and moral level, improving students' theoretical knowledge and professional and technical ability, which is the necessary means and measures to build a high-level talent training system.

### **2.3 Strengthening the practice of theoretical knowledge**

In the traditional teaching process of pharmaceutical engineering principle and equipment specialty, teachers mostly focus on textbook knowledge points. Before each class, students are required to preview the knowledge points, explain them uniformly in class, and ask students to consolidate themselves after class. Although this way can impart knowledge to students systematically and scientifically, it ignores the differences and frontiers between theoretical knowledge and actual production process, resulting in the disconnection between students' learning basic knowledge and industry practice, and the professional academic will continue to lag behind. In view of this situation, teachers should abandon the idea of taking textbook knowledge points as the center, take students as the main body in the classroom, and cultivate students' ability of practical application of theoretical knowledge.

(1)Textbook content knowledge and pharmaceutical engineering principle and equipment professional curriculum design are combined for teaching. When explaining the new content, teachers should pay attention to cultivating students' understanding of the design drawings to understand the workshop layout, unit operation equipment, piping equipment placement and clean area requirements of the workshop in the course design, and let students use the professional knowledge in the textbook to interpret according to the workshop layout and piping equipment layout in the process of drawing design. In this way, the combination of textbook knowledge and actual design drawings can make students understand the theoretical knowledge of pharmaceutical engineering principles and equipment more thoroughly, and strengthen their practical ability.

(2)Carrying out on-site teaching. For the theoretical knowledge of pharmaceutical engineering principle and equipment specialty, it is not limited to textbooks. Teachers should regularly bring students to the relevant practice base for practice teaching or carry out part of the class hours in the practice unit. In the teaching process, we should actively communicate with the staff of the training base, explain and study the QC laboratory, drug production workshop and preparation laboratory of the training base in detail, understand the key points and skills that need to be paid attention to in the actual pharmaceutical process, so as to enable students to combine the knowledge in the textbook with the practical application, and greatly improve the teaching effect Improve students' practical skills.

### 3. Conclusion

“Made in China 2025” puts forward the strategic goal of building a powerful manufacturing country. The transformation from a labor-intensive manufacturing country to a technology and information intensive manufacturing country is inseparable from the transformation and upgrading of the industrial structure “the integration of industrialization and informatization”. The integration of industrial chain, process transformation, management optimization and technological innovation urgently need a large number of high-quality, skilled and innovative enterprises knowledge and skill talents. The pharmaceutical engineering equipment and principles of professional courses can effectively improve the students' theoretical knowledge and industrial application technology skills, and this practical course can also cultivate students' independent thinking ability and the ability to apply theoretical knowledge to the actual operation process. Therefore, the reform of higher vocational undergraduate professional courses is now an urgent demand. Of course, this is a long-term reform process, and there are many more difficult tasks and problems in the reform process. For example, the theoretical teaching process may make students not adapt to the short-term, the service life of laboratory experimental equipment is greatly reduced, the work intensity of teachers is also greatly improved, and the construction of practice base and the difficulty of school enterprise cooperation are increased.

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