

Research on the teaching method reform of virtual simulation experiment teaching and practical operation combined with Durgs production training

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Abstract: Production operation is an important link in the teaching of drug production training course. It is of great significance to improve students' understanding of basic knowledge and mastery of production norms. This paper probes into the reform and exploration of the teaching practice model of drug production by combining virtual simulation experiment teaching with practical operation. The implementation results show that by using virtual reality game elements and modes, the teaching mode combining serious game form with practical operation can stimulate students' enthusiasm in learning, improve the interest of learning, facilitate the cultivation of students' innovative ability and practical ability, and improve the teaching effect. Because this teaching method deeply integrates education, ideological and political education, cultivating students' knowledge, ability and accomplishment, it helps to shape students' correct values and outlook on life, enhance students' dedication and sense of responsibility to participate in socialist construction and reform, and train students to coordinate interpersonal relations, learn to cooperate with groups, and improve their adaptability to employment in the future.

1. INTRODUCTION

"Practical Training of Drug Production" is an important teaching content for pharmacy and Chinese pharmacy majors, as well as an important training link for students to acquire the ability to analyze and solve problems in practical operation^[1]. In traditional teaching, it is difficult to control the teaching links, students are not competent, ideological and political education is not enough. In the past, the practical teaching was school-enterprise cooperation. The school brought students to related pharmaceutical enterprises for internship, visit or participate in the pharmaceutical production process of pharmaceutical factories. With the implementation of the new version of production quality management standard (GMP), the industry is more and more strict to the production link management and environmental requirements of enterprises. It is difficult for enterprises to arrange a large number of students to the production line for practical training and learning, students can not personally experience and operate the pharmaceutical process. Therefore, the practical training effect is very limited and it is difficult to achieve the expected teaching objectives^[2-6]. Under the new situation of Chinese pharmaceutical industry, the professional quality requirements of practitioners engaged in drug production are no longer simple equipment operators, but should have certain product processing ability, on-site production process online quality control ability, engineering ability and certain GMP inspection

preparation ability. The mode of traditional drug production training which only emphasizes operation but neglects ability cultivation is out of line with social demand. Traditional practical teaching mainly focuses on the formation of students' operational skills, but less on professional spirit education, such as professional ethics, pharmaceutical thinking, team spirit, etc., and has insufficient influence on the cultivation of students' souls^[7-10].

2. METHODS

From the perspective of students' needs, social needs and professional development needs, the teaching group set up a professional training platform including a workshop of oral solid preparation of traditional Chinese medicine, a simulated drug testing laboratory and a computer virtual simulation laboratory, and introduced technical executives of well-known pharmaceutical companies, the director of the laboratory of Provincial Drug Testing Institute and other experts as course leaders. It adopts virtual simulation teaching, super star learning and online discussion, on-site teaching, post role playing and other methods to carry out online and offline, in-class and extra-class integrated blended teaching.

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2.1 Focusing on the cultivation of students' thinking mode, the teaching group expands course content and integrates multiple situations to create a blended teaching mode of "online + offline + virtual simulation + practical training".

With the practice of pharmaceutical production and testing vocational training as the core, the teaching group cultivates the thinking ability of pharmaceutical production and testing by means of virtual simulation teaching and online discussion of superstar learning. The teaching group enhances the competency of post by simulating the on-site teaching, practical operation, post role playing and virtual simulation, and deeply integrates professional education, ideological and political education. A new pharmacy education model of "online + offline + virtual simulation + practical training" has been established, which combines virtual simulation and practical training with practical operation.

2.2 As the essence of traditional Chinese culture, traditional Chinese medicine culture reflects the core value of Chinese culture, and traditional Chinese medicine has become a "Chinese name card" and "Chinese symbol".

In the process of practical training and teaching, the teaching group takes the modern preparation production of classical prescription as an example to dig deep into the profound cultural attributes behind each recipe, so as to skillfully integrate it with the teaching content. The teaching group creates ideological and political situations for students, and guides the values of students from multiple perspectives, aspects and levels, so that they can feel empathy and resonate in their hearts.

2.3 Virtual simulation training breaks through the barrier of time and space, opens the boundary of books, and students can carry out experiential learning.

Students perform online simulation exercises, experience the production of Shuanghuanglian oral liquid immersively, play a role (7 key positions) in a virtual learning environment, feel the role tasks (54 tasks), and complete the job tasks. The whole process. Learn about Good Manufacturing Practices (GMP), modern pharmaceutical preparation production technology, pharmaceutical preparation equipment, post standardized operation (SOP), pharmaceutical production process quality control, workshop management and other knowledge content in simulation exercises with immersive experience to realize theoretical knowledge integration with practical operations, simultaneous improvement of knowledge and abilities, and training of students' professional qualities.

2.3.1. Virtual simulation platform construction

The virtual simulation platform consists of three modules: "knowledge points", "training simulation", and

"assessment system". Students learn system knowledge in the knowledge point module through multimedia, and then enter the practical training simulation module for practical training. Real-time feedback of teaching results is carried out in the assessment module.

2.3.2. Knowledge Point Module

This module includes four parts: GMP knowledge points, self-study micro-classes, equipment process display and reference materials.

GMP knowledge points part: Contains 10 small modules, with more than 100 graphic explanation files. Teachers use text, pictures, tables and other forms to explain GMP standard operating procedures in detail, and design knowledge points in strict accordance with teaching requirements to help students better learn Chinese medicine GMP knowledge through software and improve classroom teaching efficiency.

Self-study micro class part: Including equipment function principles, graphic design drawings, computer-aided design (CAD) drawings, real equipment photos, dynamic industrial schematic diagrams and production record files, with the help of text, pictures, Flash, 3D models, audio, Video and other multimedia forms of display effects make learners immersive, three-dimensional and intuitive, generate a strong desire for participation and interest in learning, and effectively improve students' learning efficiency.

Equipment process display part: The process principle of material mixing, extraction, liquid preparation, and potting equipment is decomposed and displayed. The equipment profile is decomposed and displayed in the form of dynamic Flash to show the operation principle of production equipment and the way of mechanical movement to help learners perceive. Understand the principles of equipment and technology, visualize the abstract internal structure, make the image intuitive and easy to understand, and achieve the goal of getting twice the result with half the effort.

Reference material section: The current GMP management documents of the company collected from the cooperative pharmaceutical companies, including detailed documents of 26 modules, combined with more than 2000 graphic explanation documents, to facilitate students to understand the production management of pharmaceutical companies.

2.3.3. Training Simulation Module

The simulation scenario integrates GMP requirements and knowledge points throughout the production process of each post, allowing students to simulate the role of the post, feel the role and task, and complete the entire process of the task. The practical training simulation exercise strives to realistically simulate each production process, conduct a detailed and in-depth analysis of the work content of each simulation "role", and concentrate a variety of knowledge points that need to be conveyed to the "role", including the reading and writing of work documents, Manage the use of documents,

pre-production inspections of key operating procedures, material receipts, processing and production, post clearance, clearance inspections and leaving the workshop, and strive to allow students to complete a zero-distance practical operation experience in a relatively short period of time.

2.3.4 An Assessment System Module

In order to meet the teaching goals, test the teaching effect and the students' knowledge mastery, the platform has set up an assessment management system, which has added multiple types of pharmaceutical knowledge question banks, including multiple choice questions, true or false questions, simulation questions. Teachers can also insert self-summarized knowledge points into the question bank at any time, and teachers can randomly make test papers according to different assessment objects. The system has a relatively strict authority mechanism. The content of the question bank can be drawn up according to the assessment requirements. Teachers are allowed to set up relevant text test question modules and three-dimensional simulation operation assessment modules under the network environment, and combine them into a network test paper for students to test their own learning effect during the training period. The assessment system has a complete statistical function. Teachers can instruct students to learn more in-depth practical skills and have a deeper understanding of the production principles and processes of Chinese medicine preparations by analyzing the results of students' examination papers.

2.4 Division of labor, full participation, inquiry learning

In the process of practical operation, students are divided into groups, and each student is assigned a position role in a pharmaceutical enterprise, such as workshop director, technology technician, QA inspector, QA minister, QC, clearance person, etc. In the production process, under the guidance of GMP theory, the SOP of each position is strictly implemented. Students take on the tasks of each role by themselves. Through the explanation and practical operation of each process, students can get professional ability training in related professional positions, including practical knowledge and skills, working procedures and methods, and enhance students' dedication and responsibility. Cultivate students' post competence, pharmacy professional ethics and teamwork consciousness.

3. TEACHING EFFECT

After the students have passed the virtual simulation training and passed the examination, on the premise of ensuring safety, all the production and inspection equipment, feeding and discharging steps are operated by the students in the group. Students cooperate with each other to complete the production task. After a series of

production processes, they finally get the qualified production products successfully, realizing the virtual to promote the real.

Virtual simulation technology is used to transform the real production workshop into an operable practical training classroom through 3D virtualization technology. Information is transmitted to students through text, video, gifs and other media, so as to transform abstract and difficult knowledge into vivid and interesting simulation scenes. Teaching forms become rich and diverse, increase the interest of students' learning, give play to students' subjective initiative in learning activities, more conducive to the cultivation of students' independent work ability, better mobilize students' learning enthusiasm.

4. CONCLUSION

By introducing virtual simulation technology into traditional teaching, the teaching group discussed the teaching mode of combining virtual and traditional teaching in the practical training of drug production, which alleviated the problems of knowledge points which could not be fully mastered and experimental operation process which could not be fully experienced due to factors such as internship conditions, internship opportunities and teaching forms. The combination of virtual simulation and traditional teaching model enhances the interest of the course and stimulates the learning initiative; Improved and enriched the teaching methods of practical training course of pharmaceutical production, explored and summarized a set of brand new teaching mode combining virtual-reality, which provided theoretical and practical experience reference for other practical teaching courses of pharmaceutical subject.

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