Application of Network-Mindmap teaching method based on pharmacy professional certification in pharmacy experiment course

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Abstract: The pharmaceutical industry is recognized as one of the most promising international high-tech industries in the world, and it is also one of the "sunrise industries" with the fastest growth in world trade. At present, China's pharmaceutical industry is developing rapidly, the pharmaceutical industry's annual economic benefits growth rate, has exceeded the national economic growth rate. At present, the research and development of new drugs in China is still in the main stage of generic drugs, and a large number of pharmaceutical professionals are needed to engage in the research and development of new drugs, technological innovation, drug production, inspection, circulation, use and management. However, with the rapid development of the industry and the increasing demand for innovative thinking and ability of practitioners, the former pharmaceutical talent training model began to fall behind The Times, and it is urgent to reform and innovate on the basis of the original model. Especially after the introduction of the "Healthy China" 2030 Plan Outline, the development of China's pharmaceutical industry and the reform of higher pharmaceutical education will be further pushed to a climax.

Key words: mind mapping; Pharmacy major; Experimental courses

1. Cultivation of pharmaceutical professionals

According to the suggestions of the professional curriculum system in the National Standards for Pharmaceutical Teaching Quality, pharmacy course is one of the core courses for pharmaceutical majors. Pharmacy is a comprehensive applied discipline with drug preparation as the center to study its basic theory, prescription design, preparation technology, quality control and rational application. It is comprehensive, professional and experimental, and has the characteristics of rapid update of related knowledge and market. In the past, the teaching process of pharmacy courses was mainly based on teachers teaching in the classroom. This training mode was to achieve the purpose of imparts knowledge to students. However, this teaching mode was too rigid, lack of communication between teachers and students, and students' low initiative in class, resulting in students' single thinking mode, less applied and innovative thinking, and insufficient understanding of knowledge. Unable to form a systematic knowledge framework in the brain, it is difficult to stimulate their interest in in-depth exploration, lack of enthusiasm, and can not meet the requirements of today's society for the cultivation of innovative applied talents in pharmacy.

2. Current situation of pharmacy experiment teaching

The goal of China's development from a medical power to a medical power is to train high-quality pharmaceutical talents with a solid foundation, humanistic feelings, scientific spirit, international vision, professional quality and ability. Considering that the pharmacy major of our university is about to face the opportunity of professional certification, how to better train pharmaceutical professionals with creative thinking and able to propose and solve scientific problems to support the development of the pharmaceutical industry in Northeast China has been the direction of long-term exploration and exploration for teachers engaged in pharmaceutical teaching.

3. Mind mapping and pharmacy experiment teaching

mind map, also known as mind map, was first proposed by the famous British psychologist and educator Tony Buzan in 1971. It was first used in the business world, and also has wide prospects in the fields of medicine and education. It is a kind of thinking visualization mode18 or efficient graphic thinking tool to express radioactive thinking, and also a visual semantic network, which can convert cold data into images or graphics, that is, the graphical thinking of integrated use of words, symbols, pictures and colors, and establish the corresponding memory link[between knowledge points and keywords with images, colors and other information. It displays the knowledge structure intuitively with tree-like divergence structure, summarizes and summarizes the basic knowledge points in books, and forms a knowledge network system.

Pharmacy experiment is an important teaching link to verify the pharmacy theory and consolidate and deepen the theoretical and practical ability. It is a comprehensive professional discipline with a relatively complex knowledge system, scattered content, rapid knowledge update and too much information, and it is very practical and theoretical. The pharmacy experiment course is a practical course set up on the basis of the theoretical knowledge of pharmacy, which mainly emphasizes the application of the theoretical knowledge of pharmacy and the cultivation of hands-on ability, and has strong practicability and application. In pharmaceutical experiments, students need to master the basic operation of drug preparation, the use of common preparation equipment and the preparation of common drug preparations, etc. In practical teaching, due to the reasons of class time and experimental equipment, there are many and frequent experimental courses, and some experimental operations are complicated, and students cannot fully understand them in a short time, resulting in low learning interest, insufficient preparation or copying of lecture notes. Did not fully think, the experimental principle, mechanism and operation of

the understanding is not deep, unfamiliar, the overall learning is more passive, do not know how to solve the problem, resulting in frequent situations in the process of the experiment, can not achieve the ideal experimental effect, affecting the students' in-depth understanding of knowledge and practical operation ability. When teaching, teachers explain each content of the experiment too carefully, often fail to highlight the correlation between various knowledge points, ignore students' mastery of knowledge points, and lack of interaction in class, which is not conducive to the formation of innovative thinking models for students.

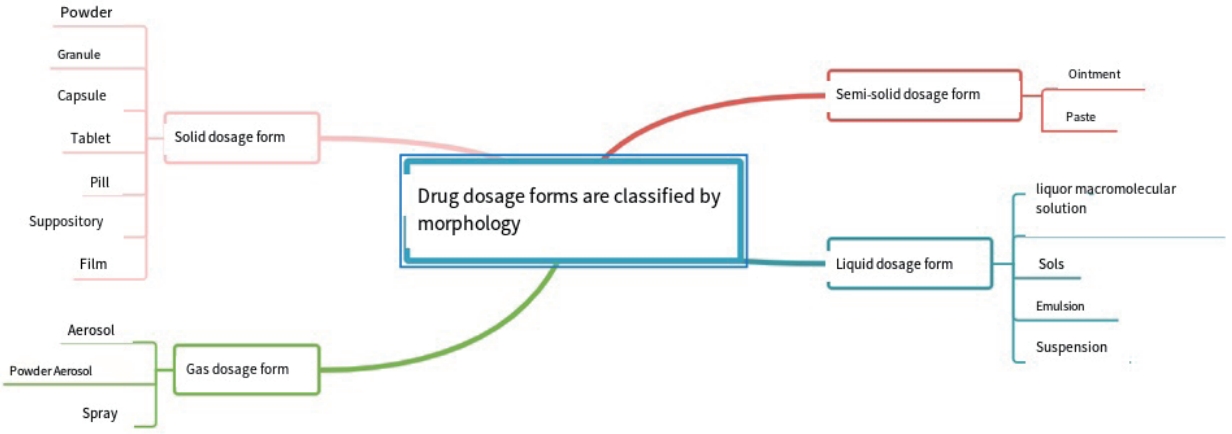

Figure 1 Mind map of drug dosage forms classified by dispersion system

Through the means of mind mapping, a complete closed-loop experimental teaching of "preparation of dosage form -- forming theory -- experimental operation -- verification theory" in the pharmacy experiment course can be fully reflected. For example, the preparation experiment of liquid paraffin emulsion, the teacher relates the emulsion preparation method, dry glue method, wet glue method, emulsification method, mechanical method, etc., to the forming theory of the emulsion, so as to deduce that the emulsion preparation process will cause different emulsion types due to the types of emulsifiers, and also let students think of the precautions in the process of experimental operation. Finally, through the quality inspection of the prepared emulsion, So as to verify the theory of emulsion formation. Through the introduction of this thought through type, not only the theory course is cleverly integrated into the experimental course, but also the students can understand the learning purpose of the experimental course more clearly.

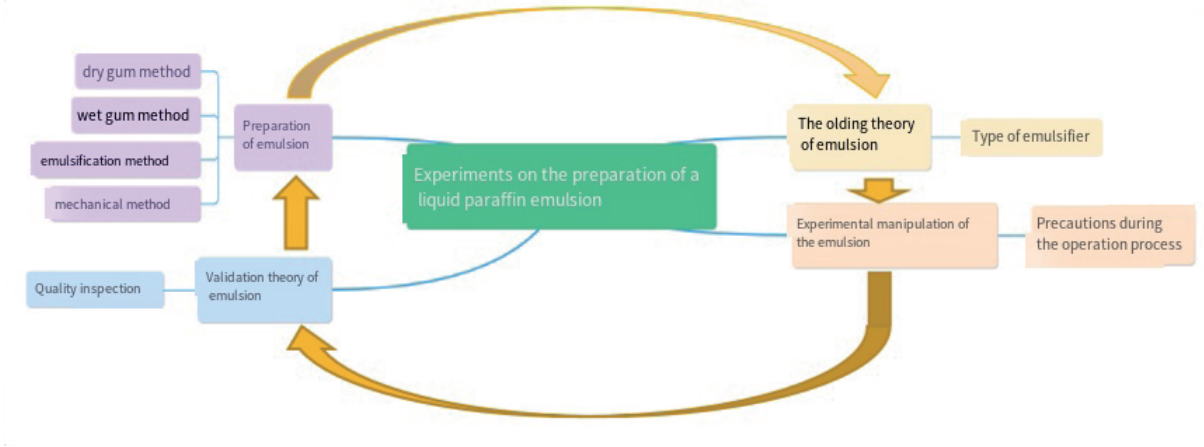

Figure 2 Mind map example: preparation of emulsion

The use of mind map can present the correlation and subordination between the thinking process and the topics at all levels, improve the thinking ability of the left and right brain of the human body, thus deepening the understanding and memory of knowledge points, improving the logical way of thinking and the sense of unity and cooperation of the individual, and stimulating the imagination, creativity and association of students. It shows us a relatively clear thinking line, so that learners can be more interested in it.

In the teaching process, teachers not only need to help students establish a professional thinking system and consolidate the theoretical foundation of pharmacy through reasonable knowledge and understanding guidance. At the same time, it is also necessary to strengthen the docking of theoretical knowledge and experimental projects through experimental teaching guidance, improve students' comprehensive abilities in practical operation, innovative understanding, scientific literacy and observation cognition, and effectively master the professional knowledge and pharmaceutical technology of pharmaceutical disciplines. In view of this, image information is easier to remember than text information, and color images leave a deeper impression than black and white images. Accordingly, hyperlinks can be inserted in text and images to link to some animation or video that is more vivid and easier to understand, increasing the intuitiveness and interest of the classroom. Flexible mind maps can also enrich teachers' classroom design content. Therefore, the use of network-mind map can help us better clarify the logical relationship between knowledge points, so as to help students remember the related knowledge system.

The mind map should be reasonably introduced, which not only has application in experimental courses, but also can be incorporated into the grading criteria of the semester when assigning preview tasks for teaching preparation. While urging students to think carefully and complete them carefully, the state of students' thinking mode, as well as the depth and clarity of knowledge understanding should be judged. Through the teacher's mind map to explain in class, assist students to combine the two mind maps, improve their own ideas, guide students to arrange the experiment order reasonably, let students with thinking independent experiment operation, put an end to "look at the handout, do one step experiment" mechanical behavior, better complete the experiment task. Finally, cultivate students' ability to analyze problems, solve problems and cooperate in teams, laying a good foundation for their future work.

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Fund: Research Project of Education and Teaching Reform, Jiamusi University, Project number: 2021JY2-87