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Exploration of Online and Offline Mixed Teaching Mode in Pharmacology Experiment Teaching for International Students

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Abstract: With the deepening of reform and opening up, the continuous improvement of comprehensive national strength and international influence, the enrollment of international students continues to expand, and the education of international students has become an important part of China's higher education. Combined with the problems existing in the pharmacology experiment teaching of international students in our university and their own characteristics, this paper introduces the online and offline mixed teaching mode into the pharmacology experimental teaching of international students, in order to improve the experimental teaching effect and provide useful reference for the guarantee of teaching quality of international students.

Keywords: Pharmacology; Experimental teaching; International students; Mixed teaching.

1. Introduction

In recent years, with the economic development of China, the improvement of international influence and the rapid development of medical education, the number of medical overseas students in China has increased rapidly , the foreign student education has become an important component of higher medical education, the teaching method of medical students study for the construction of high level medical university, promote the medical higher education internationalization in our country is of great significance [2,3].

Pharmacology is a medical subject with strong application, and its experimental teaching plays an important role in the whole teaching process. A good pharmacology experiment course can not only enable students to verify and consolidate the theoretical knowledge they have learned through practice, but also cultivate students' ability to find, analyze and solve problems through experiments, so as to comprehensively improve students' quality and professional ability.

Therefore, it is an important task for medical education in colleges and universities to actively explore the teaching mode of pharmacology experiment for foreign students in order to improve the teaching quality of international students and enhance their learning ability, innovation ability and practical ability.

2. Characteristics of pharmacology experiment teaching for foreign students

2.1. Source of international students

The international students enrolled in our school are mainly 5-year undergraduate students majoring in clinical medicine, mainly from India, Rwanda, Pakistan and Nepal. Due to the influence of factors such as low entry threshold of international students, the quality of international students is uneven, and their knowledge and language level and cultural foundation are quite different. Excellent students have strong acceptance ability, and have a certain medical foundation, good at thinking, strong practical ability, can actively discuss problems related to the experiment; And some students are undisciplined, passive learning, late and early leave, language ability and practical ability is poor. Therefore, for the experimental teaching of foreign students, it is necessary to reform the traditional teaching mode and adopt a teaching method that can stimulate students' self-learning, so that they can learn actively anytime and anywhere, so as to improve their interest in learning and improve the teaching effect.

2.2. Traditional teaching of pharmacology experiment for foreign students

The pharmacology experiments of international students in our school are mainly taught face-to-face in class, with teachers relying on textbooks, PPT and chalk [5,6]. The teaching activities in class take the teacher as the main body. The teacher tells the principle of experiment purpose, operation steps and matters needing attention, and the students complete the experiment as required. As the students did not conduct effective preview in advance, and there were certain barriers in the language communication between teachers and students, the students could not digest what the teacher said in a short period of time and began to experiment, the experimental results were not ideal. The teaching content is dominated by confirmatory experiments, and the experimental conclusions are predictable, which cannot fully inspire students' innovative thinking. Students just finish the experiments mechanically step by step according to the requirements of the experiment, without thinking about why to do so and whether to complete them with other ideas. Teaching language in the UK, although most teachers have abundant teaching experience, but still exist in English listening comprehension, oral expression and not enough skilled shortcomings, such as some shaky English students didn't don't listen to understand, the way of thinking is not clear, the experiment principle can't understand, is not sure of experiment content, the serious influence the teaching quality.

2.3. Limitation of experimental hours and conditions

Under the condition of limited experimental class hours, operating conditions and equipment, 18 experiments were arranged for 72 class hours of pharmacology experiment, and each experiment lasted 4-6 class hours, which could not fully meet the needs of theoretical courses. Therefore, a network teaching platform can be built to provide students with more and richer resources in the form of videos, micro lessons or virtual experiments, broaden their horizons, help students understand relevant cutting-edge knowledge of science and improve their interest in learning.

3. Design of online and offline mixed teaching mode for pharmacology experiment

3.1. Teach students according to their aptitude and optimize experimental teaching content

According to the national standards of teaching quality for international students, the research team made reasonable teaching plans and syllabuses in combination with the talent cultivation program of the university, formulated the learning objectives of pharmacology experimental courses and teaching objectives of each course in combination with the characteristics of international students and pharmacology experimental courses, discussed the teaching contents, and listed the key points and difficulties. In accordance with the principle of reducing basic experiments and increasing comprehensive and designed experiments, the experimental teaching content and case discussion should be rationally selected. Following the pace of national education informatization, we should properly handle the relationship between real experiment and virtual experiment, and adhere to the principle of "virtual + reality" and "online + offline".

3.2. Prepare online experimental teaching resources

Combining with international students' cognitive law, the teaching content of pharmacology experiment is arranged step by step to enhance the intuition of students' learning and reduce the difficulty of students' self-learning. Teachers upload experimental teaching materials one week in advance, including courseware, teaching plans, videos, animations, pre-class learning guidance, self-test after class, etc. Adjust the teaching plan according to the needs of online teaching, and fragment the knowledge points. Especially for some theoretical or abstract concepts or mechanisms, animation or micro-video should be prepared to facilitate students' self-learning, and strive to let students complete the learning objectives within the effective time.

3.3. Implement online and offline mixed teaching activities

3.3.1. Online preview before class

Teachers guide international students to conduct independent learning according to teaching objectives and task lists, including online resources such as courseware, teaching plans, textbooks, animations and videos, and require students to list learning Outlines, summarize problems encountered in the process of self-learning, and conduct in-group or inter-group discussions in groups. Students by watching "online" experimental teaching video and complete the online test, to the operation of the laboratory safety pharmacology experiment methods accomplish know fairly well, still can't solve the problem through QQ group or WeChat group of online platforms, such as feedback to the teacher, so that the teachers in the classroom a targeted to disabuse, improve pertinence and effectiveness of teaching. At the same time, teachers use the digital function of the teaching platform to timely grasp the situation of students' self-study and supervise the students who do not actively participate.

3.3.2. Guidance on answering questions in class

In class, first of all, the student representatives share the harvest and unsolved problems after learning the task list. Then, the problem of teachers to students and students before class preview problems for explanation, and emphasizes the experiment operation, experiment equipment use method and the matters needing attention and so on, then, student grouping experiment, teachers' guidance, real-time interaction between teachers and students, such as problem can consultation on the spot or with the help of the micro video and virtual simulation resources. After the experiment, the teacher organized the students to summarize and analyze the experimental results in groups, give the overall evaluation, summarize the key and difficult points of the experiment, and emphasize the writing of the discussion part in the experimental report.

3.3.3. Reflection and consolidation after-class

After class, students can flexibly arrange their time according to their own actual situation to conduct targeted review and complete the experiment report and reflection summary with the support of micro-video and virtual simulation platform. For problems existing in experimental operation, online resources can be reused for repeated operation and continuous consolidation; For the problems that cannot be solved, we can feed back to the teacher through QQ group or wechat group and other online platforms to solve them.

3.4. Assessment

In order to make the examination of pharmacology experiment course fairer and more transparent, and mobilize the enthusiasm and participation of students, pharmacology experiment adopts a multi-type evaluation system, and the evaluation of course learning runs through the whole process of experimental course learning. It is mainly composed of five parts: online learning assessment (10%), offline classroom (including experiment participation and experiment operation, etc. (10%), usual experiment score (10%), experiment operation test score (20%), and final theory test (50%). The total score is 100, ≥60 is qualified.

4. Teaching Evaluation

This study investigated the effect of online and offline mixed teaching mode of pharmacology experiment and the satisfaction of overseas students with the mixed teaching mode through questionnaire survey. The research group designed its own questionnaire (including 6 survey items) and conducted the survey in an anonymous manner. 68 questionnaires were sent out and 68 were recovered with a recovery rate of 100%. According to the questionnaire analysis of foreign students participating in the reform of

online and offline teaching mode of pharmacology experiment, 89.7% of foreign students agree that the online and offline teaching mode is conducive to the understanding and mastery of knowledge points; Most international students believe that the online and offline hybrid teaching mode can improve students' interest in learning, cultivate their ability of independent thinking and independent learning, and facilitate the improvement of students' comprehensive ability to analyze and solve problems. This hybrid teaching mode should be continued.

Table 1. Questionnaire survey of overseas students on online and offline blended teaching mode

Research content	approval	Approval rate (%)
Conducive to the understanding of knowledge points, master	61	89.7
It can stimulate students' interest in learning	58	85.3
It can improve student participation	60	88.2
It is beneficial to cultivate students' ability of independent thinking and independent learning	59	86.8
It is beneficial to improve students' ability to analyze and solve problems	55	80.9
The blended online and offline teaching model should be continued	64	94.1

5. Discussion

In view of the defects of traditional experiment teaching in our school and international students and the courses characteristics, we follow the pace of national education informatization, actively carry out experimental teaching reform for foreign students, optimize the pharmacology experiment teaching content, enrich teaching resources, also the online and offline blended teaching mode was introduced into the teaching of pharmacology experiment for international students .and the students' satisfaction is higher, the teaching effect is better.

Students in medical education is the medical colleges and universities in a new task faced by the new medical background [7-9], how to improve the teaching quality of students is a long-term exploration process, we will continuously explore in the teaching practice, and constantly strive to improve the teaching level and teaching quality, training to adapt to international competition demand high levels of medical students.

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