

Teaching Reform and Practice of "Pharmacology" Course Based on "Online and Offline Mixed Mode"

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Abstract: "Pharmacology" is a very important professional core course for pharmacy majors. In order to improve the students' poor learning initiative, low interest and unsatisfactory learning effect in the traditional teaching mode of "pharmacology", reformation methods of it was carried out in this paper. Undergraduates of different specialties in pharmacy and pharmaceutical preparations apply the traditional and new methods respectively. After one year practice the undergraduates from two major of pharmacy and pharmaceutical preparations exhibit different satisfied toward the traditional way and new method, respectively. The results show that the students who adopt the new method have better learning satisfaction than the traditional method.

1. Introduction

"Pharmacology" is a very important professional core course for pharmaceutical majors. It is a discipline that studies the interaction and law between drugs and human body, and also an interdisciplinary subject based on medicine, pharmacy and life science [1]. "Pharmacology", which involves multi-disciplinary basic and clinical knowledge, has the characteristics of complex content, abstract concept and difficult to understand. The traditional "cramming" teaching mode of "pharmacology" only focuses on the one-way infusion of knowledge, less interaction between teachers and students, poor initiative of students' learning, low interest in learning, single assessment mode, and difficult to monitor the learning effect [2]. Therefore, the teaching effect is not satisfactory, the professional knowledge and skills of the students trained are not solid, and the professional practice ability is lacking, which is difficult to meet the needs of society. In most colleges, the traditional way of teaching is still "cramming" teaching mode. Therefore, it is necessary to reform the teaching mode.

The combination of online and offline teaching reform of "pharmacology" course is an effective way to improve the comprehensive quality of students and the quality of education. The establishment of an effective teaching evaluation mechanism from the perspective of students plays an important role in gradually improving the quality of teaching, expanding the scope of teaching, further improving the comprehensive skills of students and expanding the understanding of cutting-edge knowledge [3]. Through the continuous construction of classroom teaching, the original conservative, closed and single teaching operation mode was broken, and a new generation of composite, application and innovative talents adapted to the needs of the new situation was cultivated for society. In 2018, the Ministry of Education proposed that "colleges and universities should comprehensively sort out the teaching content of each course, enhance the academic challenge of college students, reasonably increase the difficulty of the course, expand the depth of the course, expand the optional nature of the course, eliminate the "water course", and create a high-level, innovative and challenging golden course" [4].

In response to the above issues, we should further promote the "Internet + Higher Education", promote the transformation of higher education through the profound transformation of education and teaching mode, and vigorously promote the application of modern information technology. This project intends to carry out the "flipped classroom" teaching reform through the construction of

online open courses, the creation of online and offline hybrid “golden course” suitable for the characteristics of students and the needs of talent cultivation in our school, so as to effectively improve the classroom teaching effect, improve the teaching quality, and cultivate high-quality talents with professional knowledge and skills and strong practical ability.

2. Methods

Methods of comparative analysis and market research were applied in our project [5-8].

Before we start this study, firstly, an investigation was carried out to study the current situation of the teaching mode of pharmacology in most universities in China. The research results provide an important basis for the reform of curriculum teaching. According to the students' learning state and learning situation, a systematic assessment of teaching process is carried out, which is called “formative assessment”. Secondly, according to the research results, a reasonable reform plan is designed, which is to form the core framework of pharmacology curriculum of “modularization + case study”, combine online and offline teaching. The PBL method runs through the whole teaching process, and promote the overall development of students with “formative evaluation”. We carried out our plan in class and several pharmaceutical companies in Nanchang of Jiangxi provinces, which are near to our school so that we can decrease the spending of this project.

We chose the undergraduates majoring in pharmacy and pharmaceutical preparation from the same school and teacher as the research objects. Grade 18 pharmacy (named group one) was used as the control group and grade 18 pharmaceutical preparation (named group two) as the experimental group. For different groups, we choose different teaching methods. We used new methods to teach the second group and traditional methods to teach the first group.

Firstly, we have changed the mode of teaching. The group one adopts the traditional “cramming” teaching method. That is, teachers usually explain to students in the form of PPT or blackboard writing. In group two, we use the improved method to teach the students. That is to say, we should make full use of the rich online open course teaching resources to let students learn online resources, and then carry out practical learning, group discussion and other learning methods. Secondly, the total teaching time for group one and group two is the same. The group one differs from the group two in the need to discuss learning in class. In group one, there is no need to discuss learning. In group two, each group requires multiple discussions and exercises. Finally, both groups took the final exam, and took the results as one of the important aspects of the final results. In addition, at the end of the semester, the satisfaction survey was conducted by anonymous online voting, as one of the final results of this study. What's more, all the reformations were listed in the Table 1.

Table 1. Differences in teaching methods

Comparison of two teaching methods	
<i>Traditional methods</i>	<i>Reform methods</i>
According to the time and place specified in the syllabus	After mastering basic skills, practice teaching in medical colleges and universities in different stages
Textbooks are uniformly customized by the whole school	After learning online resources, PBL teaching mode and flipped classroom are combined to teach
Traditional chalk or PPT teaching method	For the questions with more online questions, teachers answer them in person and discuss the teaching in groups on the important questions.
The assessment method adopts a single final examination for evaluation	Make full use of the interactive assessment in the classroom and carry out the assessment of "formative assessment" in the network resource system

3. Results

One year later, the new method was applied to the school of pharmacy, Jiangxi Science & Technology Normal University. The new method is evaluated through experiments and has certain advantages compared with the traditional method. The results show that the effect of the new method is better, and the learning performance of the group two is better than that of the group one. It's easy to see that the average score of the group two is much higher. Moreover, students are more satisfied with the new method, and most students do not want to participate in the first group of traditional teaching.

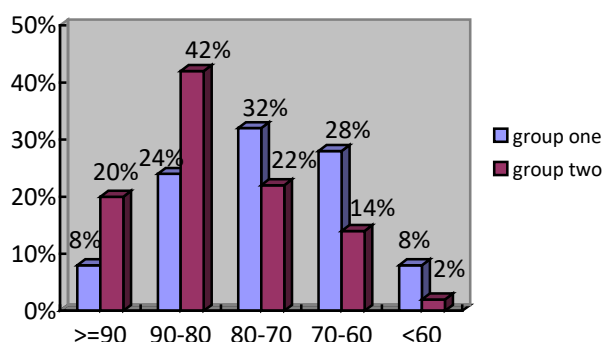


Fig. 1. Statistics of finally scores of the two groups

From Fig. 1, we could see that the scores of the group two of students are much better than those of the group one. 62% of the students have scores above 80, and the scores are concentrated in the range of 70-100. Only a few students have scores below 60.

While in the group one, students' scores are concentrated in the range of 60-90, and 8% of the students whose scores are lower than 60. This result tells us that, compared with the traditional teaching methods, the results of the group two with the new teaching methods after the reform are better than those of the group one with the traditional teaching methods.

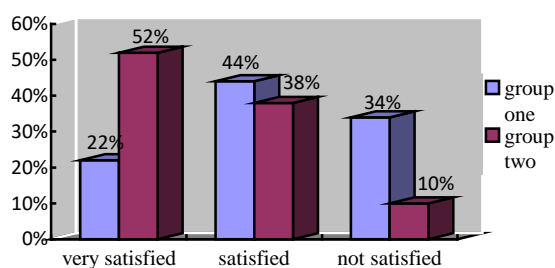


Fig. 2. Statistics of satisfaction degree of the two group toward the different teaching methods

From Fig. 2, we could know that the group two of students are quite satisfied with the teaching method after the reform, 90% of them are satisfied, and only 5 students (10%) are not satisfied. Only 66% of the students in the first group were satisfied with the traditional teaching method of pharmacology. Importantly, nearly 34% of students are dissatisfied with traditional teaching methods.

In Fig. 3, method 1 is online and offline mixed teaching, method 2 is base practice teaching, method 3 is group discussion teaching, and method 4 is "formative evaluation" teaching. From Fig. 3, we could know that the group two of students is the most satisfied with the teaching method of formative assessment, accounting for 40% of all students. And online and offline mixed teaching methods are also popular with students, accounting for 28% of all students. However, the base practice teaching and group discussion teaching methods are less popular than the first two methods, which together account for 32% of all students. This shows that in the process of teaching, it is easier for students to cooperate in learning and actively participate in learning by adopting

formative evaluation.

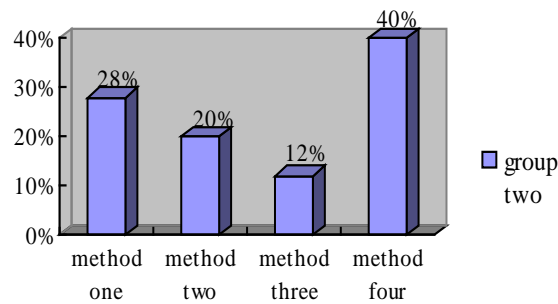


Fig. 3. Survey of the group two of students' preferences for reform methods

The new method greatly improves the efficiency of teaching and is obviously superior to the traditional method. It claimed that online and offline mixed teaching and group discussion play an important role in the success of teaching reform.

4. Conclusions

In this paper, a discussion was carried out to investigate the undergraduate teaching between the traditional way and a new method. The results show that the new method has the advantages of good teaching effect, high interest in learning and initiative learning.

This teaching reform can also be applied to other similar majors, such as biopharmaceutical major. In the near future, further research will be carried out on this teaching reform. I hope that through the reform of teaching, more and more students will benefit, not only improve their interest in learning, but also improve their learning effect.

Acknowledgment

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