

# Application of Superstar Learning Platform in Pharmacology Teaching

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**Abstract**—This paper is to explore the application effect of classroom teaching mode based on Learning Tong software in pharmacology teaching of pharmacy. 89 students in 2016 pharmacy classes of our university were randomly divided into experimental group and control group. The experimental group applied the Learning Tong-assisted teaching mode, while the control group applied the traditional teaching mode. At the end of the course, the test scores of students in two groups were compared, and the effects of experimental teaching were investigated through questionnaires, and the satisfaction of the students on the new teaching mode was compared. Result showed that test scores and teaching effect evaluation of the students in the experimental group were significantly higher than those in control group ( $P < 0.05$ ). Questionnaire results showed that the students in the experimental group generally think that the teaching mode was better in improving self-study ability and stimulating learning interest than traditional teaching mode, and their satisfaction is high. Learning Tong teaching mode can better mobilize students' initiative in autonomous learning, and has better teaching effect than traditional teaching mode in pharmacology teaching.

**Keywords**—Pharmacology; Pharmacy; Superstar; Theory teaching

## I. INTRODUCTION

Pharmacology is a subject that studies the law of drug-organism interaction and the mechanisms of drugs. It is also a link between basic and clinical courses. Traditional pharmacology teaching inculcated abstract and boring knowledge to students with teachers as the main body. Research showed that students' ability to practice and solve problems could not be effectively improved by sole and dull teaching [1]. This kind of teaching mode has great drawbacks, which seriously weakens the students' ability to learn actively and think independently.

With the rapid development of information technology, the flipped classroom teaching has become a hot topic of teaching reform and research at home and abroad [2]. Superstar Learning APP is a mobile learning professional platform for mobile terminals such as smartphones and tablet computers. Superstar Learning platform can complete group discussions, book resource inquiries, course learning and so on. At the same time, it has abundant electronic literature resources to provide convenient service for students' study [3]. This research integrates learning APP into teaching design in pharmacology teaching. It is mainly used in mobile learning and classroom interactive teaching, and has achieved certain teaching effects.

## II. OBJECTS AND METHODS

### A. Objects and students analysis

**Objectives:** The students majoring in Pharmacy in Weifang Medical College in grade 2016 were selected as the subjects. In the teaching of pharmacology theory, one class totaling 43 students was randomly selected as the experimental group of "learning APP" mode, another class totaling 46 students was selected as the control group using the traditional teaching mode. Both groups of students passed the national college entrance examination and were randomly divided into classes.

**Students analysis:** The teaching objects are full-time undergraduate students of Pharmacy. Some knowledge of Physiology and Pathology are acquired in the early stage of study, but clinical knowledge is limited due to the limitations of specialty. The content of this chapter involves part of clinical knowledge and needs more understanding. Students are accustomed to "cramming" teaching, and their active learning ability needs to be strengthened. Through investigation, students are very interested in flipped classroom model. In view of this, teachers using teaching reform can stimulate students' learning initiative, enhance students' interest in learning, and cultivate students' thinking mode, will fully mobilize students' initiative and enable students to experience the fun of learning.

### B. Teaching methods of experimental group

In the class of the experimental group, the teaching mode using learning platform APP is implemented in the teaching of pharmacology. The main teaching process is divided into three parts: pre-class teaching, in-class teaching and after-class teaching as shown below.

**Pre-class teaching,** Teachers publish relevant PPT and short videos of teaching content on the learning platform and raise of the questions to guide students to preview and think. **In-class teaching,** teachers explain what they are learned in a guided way. Cases and flashes were adopted while students had lots of questions to strengthen the understanding of knowledge. **After-class teaching,** summarize the main points of learning and choose the appropriate test questions in the learning platform combined with the situation of classroom teaching.

In the control group, the teaching classes are divided into two parts: in-class teaching and out-of-class teaching. Teachers explain the main theoretical knowledge in classes. And students preview the theory lessons well after class.

*C. Practical examples in experimental group*

Take Chapter 22 Antiarrhythmic drugs as an example (Textbooks for the 13th Five-Year Plan of the National Health and Family Planning Commission, Pharmacology edited by Yili Zhu and Ming Yin, People's Medical Publishing House., 2016 edition). The teaching implementation includes three parts: pre-class study, in-class discussion and after-class reinforcement.

1) *Pre-class study*

a) *Teacher preparation*

Considering the knowledge of students, teachers prepare relevant clinical cases of arrhythmia, teaching courseware, relevant video materials of antiarrhythmic drugs and basic test questions for pre-class preparation of antiarrhythmic drugs. The teaching materials included myocardial electrophysiology, mechanisms of arrhythmia, pharmacological effects of antiarrhythmic drugs, clinical application, adverse reactions and contraindications, etc. Then upload the prepared content to the learning platform, set up the teaching content and completion time. Teachers can learn about the students' mastery before class and prepare the teaching contents in class.

b) *Students' pre-class learning*

Students can view the teaching content, preview the anti-arrhythmic drugs in advance and review the previous contents such as myocardial electrophysiology in the platform. Effective preview and review can improve the efficiency of classroom learning and keep up with the progress of teaching. In the process of preview, they mark the contents difficult to understand, consult the materials pertinently and listen to them pertinently in class. The use of teaching platform can also convey questionable parts to teachers, which will be more conducive to classroom teaching.

2) *Classroom teaching*

Teachers learn about the students' learning situation in advance through the platform APP, and adjust their teaching mode pertinently. In the classroom, PPT is used to sort out the teaching parts, guide students to think, and enhance students' ability to solve problems. Where students have more doubts, they can focus on explaining using modern teaching methods, so that students can understand what they have learned more intuitively. The electromyography of cardiac muscle, the mechanism of action and clinical application of antiarrhythmic drugs are difficult to understand for students. In the part of mechanisms of myocardial electrophysiology and antiarrhythmic drugs, flash is used to show students how to develop. In the clinical application part, it is difficult for students of pharmacy to understand because of the clinical content involved. By briefly introducing clinical cases, students can easily understand by some clinical related videos to achieve the purpose of integrating theory with practice. Learning platform APP teaching provides an important teaching link in this teaching process, which better links students' doubts with teachers' responses.

3) *After-class reinforcement*

In view of classroom teaching effect and students' mastery, teachers use the homework module and the test module in the learning platform to issue test questions and problems after-class. Students review and consolidate what they have learned by test. When students confronted with unclear questions, teachers can give timely feedback to students, which is helpful for teachers to grasp the students' learning situation. It's useful to strengthen teacher-student exchanges through the platform, improve students' learning ability and teachers' teaching effect.

*D. Examples of traditional teaching in control group*

In the control group, the traditional teaching mode was adopted. In the class, the teachers taught the pharmacological effects, clinical application and adverse reactions of antiarrhythmic drugs by PPT screening.

*E. Achievement evaluation*

After the completion of the course, the examination results of two groups were evaluated and analyzed. Closed-book examination was used in both groups. Unify the propositions and review papers.

*F. Evaluation of teaching effect*

At the end of the course, the teaching effect of two groups was evaluated by the way of pharmacological theory examination and questionnaire survey. The contents included five aspects: stimulating learning interest, improving self-learning ability, improving learning efficiency, improving the ability of analysis and problem solving, and being superior to traditional teaching mode. Using Likert scale score, 1 score stands for very disagreement, 2 score stands disagreement, 3 score stands general agreement, 4 score stands consent, 5 score stands very consent, a total of 5 - 25 score.

*G. Data analysis*

Data were expressed as mean ± standard deviation. SPSS 15.0 software was used for data processing and statistical analysis. t test was used for comparison between groups,  $P < 0.05$  was considered as the difference with statistical significance.

**III. RESULTS**

*A. Analysis of the Achievements*

Compared with control group, the test scores in experimental group were significantly higher than those of control group. The test scores of the control group were (65.13 ± 12.10) while the test scores of the experimental group were (71.00 ± 8.85). The difference was statistically significant, indicating that the reform of learning APP platform teaching mode had a better effect.

TABLE I COMPARISON OF TEST SCORES BETWEEN GROUPS

Group	Number	Test scores
Experimental group	43	71.00 ± 8.85
Control group	46	65.13 ± 12.10
t value		2.326
P value		0.0249

**B. Evaluation of teaching effect**

The results of the evaluation of theoretical teaching effects are shown in Table 2. The results showed that the students generally hold a positive attitude towards learning APP

teaching mode. They believed that the new mode is conducive to arousing students' learning interest, facilitating knowledge acquisition and improving self-learning ability and efficiency. The teaching effect scores in the experimental group was significantly better than that of the control group ( $P < 0.01$ ).

TABLE II COMPARISON OF TEACHING EFFECT BETWEEN GROUPS

Group	Number	stimulating learning interest	improving self-learning ability	improving learning efficiency	improving the ability of analysis and problem solving	being superior to traditional teaching mode	total
Experimental group	43	4.42 ±0.63	3.95 ±0.65	3.79 ±0.67	3.84 ±0.72	4.49 ±0.51	20.49 ±2.10
Control group	46	3.78 ±0.81	2.83 ±0.77	3.13 ±0.88	3.17 ±0.71	2.76 ±0.79	15.67 ±1.25
t value		4.282	6.818	3.921	3.849	11.69	12.45
P value		0.000	0.000	0.000	0.000	0.000	0.000

**C. Teaching Satisfaction**

At the end of the semester, an anonymous questionnaire survey was conducted on the teaching satisfaction of the classes implementing learning APP teaching model. A total of

89 questionnaires were sent out, and 89 questionnaires were recovered with a recovery rate of 100%. As shown in Table 3, the satisfaction of classroom teaching in the experimental group was significantly higher than that in the control group, and the satisfaction of students was better.

TABLE III COMPARISON OF TEACHING SATISFACTION BETWEEN GROUPS (%)

Group	Very satisfied	Satisfied	Dissatisfied	Very dissatisfied
Experimental group	37.21	53.49	9.30	0
Control group	23.26	55.81	25.58	0

**IV. DISCUSSION**

Flipping classroom teaching enhances students' learning effect. Students participate in classroom teaching with the help of mobile terminal APP. This interactive teaching mode greatly improves students' learning interest, and enhances students' ability of autonomous learning and problem solving. The study showed that experimental group is significantly better than control group in terms of test scores, indicating that the learning APP teaching model is conducive to improve students' performance. According to the survey results of teaching effect, students generally hold a positive attitude towards learning through mobile teaching model, and they are highly satisfied with the teaching effect in many aspects.

Superstar Learning platform is a platform for course learning, knowledge dissemination and management sharing based on micro-service architecture. It makes use of the vast amount of books, periodicals, videos and other resources accumulated by Superstar in the past 20 years, and integrates knowledge management, course learning and other applications to provide learners with a one-stop learning and working environment. Students can use Superstar Learning platform to independently complete book resources query, electronic resources search, course learning and group discussion. The platform has a wealth of Chinese and foreign literature and information resources to provide convenient services for students [4]. In course learning, the application has the functions of setting teaching task points, checking in, discussing, rushing to answer and testing. Teachers can use the platform to flip classroom teaching and record real-time teaching process and related activities [5]. Introducing learning

APP into pharmacology teaching makes teaching diversified and makes up for the shortage of single traditional teaching. The use of network terminal access resources in the platform has exercised students' autonomous learning ability and innovation.

It was reported that mobile learning mode of flipping classroom teaching had achieved good effect in the process of theoretical teaching [6]. We have made good progress in the reform of Pharmacology teaching mode by using the learning platform. To some extent, the application of learning platform enhances the students' subjective consciousness of learning and conforms to the teaching concept of "student-centered" [7]. Students found parts difficult to understand by previewing in advance. Before learning new courses, they will review the courses they have learned. Some students will consult relevant materials for places they don't understand. They can invisibly improve their ability to collect information and solve problems. At the same time, they can further solve problems by discussing. In this process, students have more opportunities to think actively. Their desire to learn knowledge is strengthened, and their self-learning ability to access information is improved. Research showed that students are generally interested in mobile learning modes [8-9]. Through question-and-answer mode in the software, it also strengthens the relationship between teachers and students, enables teachers to find problems in time and improve their teaching level through communication.

The application of learning APP in pharmacology teaching also improves the teaching level of teachers to a certain extent. As instructors and important participants in the use and

maintenance of learning platform, we should fully change the role of the classroom and give the initiative of the curriculum to the students. This is in line with the modern student-centered teaching concept. In order to achieve better teaching guidance, we should put forward higher requirements for the improvement of teachers' own abilities, so as to keep pace with the times and conform to the modern educational model [10].

#### V. CONCLUSION

The reversal classroom teaching mode based on learning platform enables pharmaceutical students to grasp pharmacology knowledge more comprehensively and systematically. It stimulates students' learning interest, fully exerts the advantages of strong mobility of network terminals, and improves students' ability of self-learning, self-innovation and personalized learning. Of course, students' practical operation ability still needs to be acquired in practice. As a supplement to theoretical teaching, the new teaching mode by learning platform can make up for the shortcomings of traditional teaching and is worthy of further application and promotion.

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#### REFERENCES

- [1] X. Tao, Z Xu, J. Yang, Y. Yan, H. Li, X. Ran, N. Xu, The Application of Student Group Discussion Study Mode in the Teaching of Pharmacology, *Chinese Medicine Modern Distance Education of China*, vol.16, pp. 7-9, 2018. (In Chinese)
- [2] K.S. Gubbiyappa, A. Barua, B. Das, C. R. Vasudeva Murthy, and H. Z. Baloch, Effectiveness of flipped classroom with Poll Everywhere as a teaching-learning method for pharmacy students, *Indian Journal of Pharmacology*, vol.48, pp. S41-S46, 2016.
- [3] H. Gu, Y. Cheng, The Application of Educational APP in Higher Vocational College Teaching --- Taking Super Star Learning Tong as an Example, *Curriculum Education Research*, vol.36, pp. 238-239, 2018. (In Chinese)
- [4] X. Cao, R. Ma, J. Gong, Situation analysis of intelligent assisted instruction tools applied to nursing teaching, *Continuing Medical Education*, vol.32, pp. 10-12, 2018. (In Chinese)
- [5] Q. Shi, X. He, Y. Xie, Applied research of super star learning in reversal teaching of higher vocational health assessment, *Health Vocational Education*, vol.36, pp. 81-82, 2018. (In Chinese)
- [6] Y. Deng, Y. Yang, P. Li, X. Li, Effectiveness and reflections of the teaching after study activity based on flipped class model, *Education Modernization*, vol.5, pp. 322-325, 2018. (In Chinese)
- [7] L.E. Curley, M. McDonald, T. Aspden, Use of a fictitious community-based virtual teaching platform to aid in the teaching of pharmacy practice skills: Student perspectives after initial implementation, *J Pharm Policy Pract*, vol.9, pp. 24, 2016.
- [8] Y. Wang, The effect of app terminal of learning app in Chinese medicine processing teaching classroom, *China Health Industry*, vol.15, pp. 136-137, 2018. (In Chinese)
- [9] C.M. Dragos, V. Dinu, C.M. Pop, D. Dabija, Scientometric approach of productivity in scholarly economics and business, *Economic Research-Ekonomska Istrazivanja*, vol.27, pp. 496-507, 2014.
- [10] J. Cheng, H. Lv, Y. Shen, S. Yue, Y. Wang, X. Hu, Research on the cultivation model of talents for pharmaceutical strategy and emerging industries in colleges and universities, *China Continuing Medical Education*, vol.10, pp. 56-58, 2018.