

# The Flipped Classrooms Based Teaching Reform and Practice on Pharmacology of Traditional Chinese Medicine with "Internet +"

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**Abstract:** *The flipped classroom arises in the context of the teaching reform based on Internet-assisted education. As a new teaching mode, it extends classroom teaching to extracurricular teaching through the subversive reconstruction of the knowledge acquisition process and classroom time arrangement, with emphasis on the cultivation of students' independent learning ability. At present, the flipped classroom has been effectively used in the teaching of various subjects, and the teaching on Pharmacology of Traditional Chinese Medicine (PTCM) is still absent. In this context, this work mainly discussed the flipped classroom teaching of PTCM in the background of the "Internet +" era to explore the application value of the flipped model in PTCM and put forward suggestions on its specific implementation.*

**Keywords:** *PTCM; flipped teaching; teaching significance; reform measures*

## 1. Introduction

Information technology enables education reform, accelerates the process of education updating, and the education field presents a new trend of diversified development. The flipped classroom, as an effective teaching model, has attracted much attention. In PTCM teaching, the flipped teaching mode emphasizes students' independent learning before class and the positive interaction and discussion between the classroom and teachers in order to create an efficient classroom. Under the flipped teaching mode, students can master the knowledge through discussion and debate, which will effectively stimulate students' enthusiasm for learning, and truly achieve student-centered teaching.

## 2. Overview of the flipped classroom

The flipped classroom is a teaching mode produced on the basis of an "Internet +" classroom. The flipped classroom, also known as an inverted classroom, is a teaching change product that changes the classroom from one-way teaching to the interaction between teaching sides. After class, students can learn the corresponding knowledge of the book and the content assigned by the teacher by watching the video materials. The video playback can be suspended or repeated. Students can also use a variety of information technology to find answers to questions in books or questions raised by teachers. For students with different learning levels and degrees, they can review at a fixed pace and preview in advance. In class, students can discuss in groups and communicate with teachers face to face [1]. This cross-complementary teaching mode outside and inside the classroom not only strengthens students' learning skills, improves the guiding status of teachers, and enhances students' interest in learning, but also meets the new requirements of higher education in the "Internet +" era. Flipped classroom teaching is an effective way to explore the new teaching mode under the background of the "Internet +" era and the future development direction of education. We should realize the advantages of flipped teaching, take the initiative to change the traditional teaching mode, and finally form an interactive classroom teaching mode with its own characteristics, various forms, good results, and promotion values.

## 3. Problems existing in PTCM teaching

PTCM is a bridge course for communicating Chinese and Western medicine, spanning medicine and pharmacy, and it also connects basic and clinical practice. Both teachers and college students can realize

the importance of this course. The PTCM course information is not easy to understand and remember, and the traditional PTCM teaching mode is teacher-centered, so the college student's ability of theory and practice to analyze and solve problems can not be exercised. This makes the enthusiasm of college students be greatly reduced. The disadvantages of the traditional PTCM teaching mode are more obvious. On the one hand, the effect of concentrated explanation is poor. At present, the PTCM course mainly adopts the conventional teaching mode. The teacher explains the theoretical knowledge intensively in class, and then the students understand and digest it. Due to the different quality and abilities of students, teachers cannot give consideration to students at different levels of students when focusing on explaining the theoretical content, and cannot ensure that every student can clearly grasp the key points of knowledge. On the other hand, there is less interaction between teachers and students. In the traditional teaching mode, teachers stress too much explaining knowledge and guiding students' experimental operations with little time to guide students to explore deeply. Students do mechanical hands-on exercises in a limited time with fewer reflections on the methods and results, and there is a lack of professional knowledge communication, and interaction between teachers and students. Many students soon forget the learning content after learning, and the experimental operation memory is also very vague. Therefore, exploring a new teaching mode, enabling students to accurately master the knowledge and skills of the course, and cultivating college students' self-learning and active learning enthusiasm has become an urgent problem for college teachers to solve [2].

#### **4. The significance of the flipped classroom in PTCM teaching**

As a new and effective teaching mode, the flipped classroom is necessary to implement it in PTCM teaching. The flipped design of the PTCM teaching course should achieve both the after-class links and the after-class links. After class, teachers can collect and provide relevant video materials and other auxiliary resources for students as much as possible through developed information network resources for students to learn and preview by themselves. In this way, teachers can understand the situation of each student's independent learning in detail, and can also grasp the students' learning confusion in time. In class, the teacher investigates the students' knowledge after class, explains and supplements the students' doubts in class, or explains the difficult problems for the students in the form of communication and discussion. In TCM teaching, for example, teachers can combine the classic clinical case of a drug's pharmacological effects and clinical application, make the students' learning interest and enthusiasm to fully mobilize, dig into the potential of the students' inner potential, and finally make students to use their own TCM MH knowledge to solve clinical practical problems. In general, the significance of flipped classrooms in PTCM teaching is mainly reflected in three aspects, i.e., to stimulate students' initiative, deepen educational reform, and optimize teaching evaluation.

##### **4.1. Stimulate students' initiative**

Under the flipped classroom teaching mode, teachers prepare teaching videos, set up micro-teaching content, decompose the classroom teaching content into micro-teaching videos, and publish them on the course website. It is pertinent to note that the length of the videos should be controlled from 10 min to 15 min. Through the introduction of micro-teaching, it is convenient for students to choose relevant knowledge points and chapters and stimulate students' interest in learning. Students can arrange their own learning plans according to their own situation, thus creating an individualized learning environment for students. In addition, the mobile Internet is used to strengthen teaching interaction and realize the exchange of teaching and learning positions [3].

##### **4.2. Deepen educational reform**

The deepening educational reform brought about by the flipped classroom is mainly realized by promoting teacher development. The reform of flipped classroom teaching mode is bound to require teachers to integrate every link of the classroom into their daily life. At the same time, the teaching materials need to be constantly updated, and all this after-class work will greatly increase the workload of teachers. The specific implementation of flipped classroom teaching mode requires a high level of teachers and high quality. Teachers should not only have very excellent classroom teaching and management ability but also have a high level of information literacy. Students can use information network resources to watch videos easily and easily, play or repeat at any time. The teacher asks the students to provide feedback information after watching the video and find the information, email, WeChat, QQ, etc. For questions that cannot be addressed, they can be left in class for the teacher to

answer.

#### **4.3. Optimize teaching evaluation**

The PTCM is a professional course for traditional Chinese medicine students majoring in pharmaceutical engineering, which is the basis of professional ability training. We should attach great importance to the reform of PTCM teaching mode, and make it clear that improving the comprehensive quality of TCM students majoring in pharmaceutical engineering is the standard to evaluate the teaching quality. Therefore, the final exam results can no longer be used as the only criterion to evaluate students' learning quality. PTCM teaching under the flipped teaching mode should take into account the diversification of qualitative and quantitative evaluation methods. The traditional PTCM teaching assessment method usually adopts the written test. Under the mode of flipped classroom teaching, the written test score obviously can not become a single index to evaluate students' learning results. Considering the characteristics of the flipped classroom teaching mode, the comprehensive assessment of student learning can be conducted from the following aspects: the written test can only be one of the assessment criteria; through the establishment of the course management platform, the learning attitude can be assessed by the performance of students in the classroom, and the students' ability to analyze and solve problems can be assessed by the discussion of clinical classic cases.

### **5. The PTCM flipped classroom teaching practice**

#### **5.1. Teaching design of PTCM experiment**

According to the basic theory of flipped classrooms, the teacher designs a new experimental teaching model. The basic idea is as follows: Before the experimental class, the teacher releases learning tasks and learning materials through the network platform to guide the students to study the experimental principles and operation methods by themselves. In the class, after the students complete the basic experiment, the teacher organizes the students to carry out the inquiry activities with the guidance of the thinking topic, so as to cultivate the students' ability of exploratory learning and research. After class, the students organize the experiment report. The specific activities in class and after class are as the following steps.

Step 1: One week before class, the teacher releases learning tasks and learning materials through the network platform and explains the experimental contents of the experiment, including experimental principles, steps, results, and conclusions, and gives 1 ~ 2 thinking questions related to the experiment, so as to carry out exploration activities in class. Study materials include study videos and documentation. At the same time, the experimental operation video was recorded to help students get familiar with the experimental environment in advance. In their spare time, students can freely choose the time, place, and way of study, study the published learning materials, and preview before class. The problems encountered in the preview and the thinking questions can be communicated in the group and found solutions by looking for information [4].

Step 2: On the basis of watching the experimental teaching video and completing the preview, the students independently completed the basic experimental content, and conducted group discussions on the experimental results and the pre-class thinking questions. This step helps students to deepen their understanding of basic knowledge and improve their ability to analyze and solve problems. The teacher comments on the students' experimental results, explains the pre-class thinking questions, and guides students to analyze and discuss the basic theoretical problems, thus fully mobilizing students' interest in learning and improving students' ability to analyze and solve problems independently.

Step 3: Students summarize the experimental results and discuss in class, and complete the experiment report. According to students' performance in class, teachers reflect on teaching and further improve teaching methods.

#### **5.2. Typical case implementation - "anti-ulcer effect of radices saussureae experiment" flipped teaching**

To demonstrate the example of the experimental teaching in the flipped classroom, we take the anti-ulcer effect of radices saussureae experiment in the PTCM course as an example. The basic content of this experiment is to verify the protective effect of radices saussureae on acute gastric mucosal injury in rats caused by hydrochloric acid-ethanol. The teaching requires students to master the anti-ulcer mechanism of radices saussureae and be familiar with the experimental method of gastric mucosal injury

induced by hydrochloric acid-ethanol in rats. According to the clear teaching process and the established teaching method of the flipped teaching mode, the teacher writes the learning task book in advance, uses the screen recording software to record the learning video, explains the principles and methods of the experiment, and demonstrates the basic experimental operation. In addition, in the learning task, the question "whether radices saussureae reduces the effect of ethanol on gastric mucosa damage by accelerating the excretion of ethanol" was proposed, and the students were required to develop a verification program for verification. One week before the experiment class, the teacher will publish the learning task book and learning materials to the class QQ group for students to download and learn. By watching teaching videos and reading learning materials, students can master the principles and methods of anti-ulcer experiments and get familiar with the experimental operation process. For the thinking questions, students have a preliminary plan for the verification method by looking for information and communicating within the group. In the class, the students independently complete the basic experiment content, communicate with each other, and correct the experiment mistakes. After that, the students discuss the thinking question, verify the scheme, analyze its feasibility, and give the final result. The teacher commented on the experimental results, and on the basis of the verification scheme proposed by the students, guided the students to conduct further gastric emptying experiments, and chose neostigmine for comparison to understand whether radices saussureae reduced the damaging effect of ethanol on gastric mucosa by accelerating the excretion of ethanol. Finally, the students found that the radices saussureae dose used prevented ulcers but did not significantly accelerate gastric emptying. On this basis, the teacher guided the students to discuss the anti-ulcer action mechanism of radices saussureae. Through this experiment, the students deepened their understanding of the anti-ulcer action mechanism of radices saussureae, and also improved their ability to analyze and solve problems.

## **6. The coordination and optimization of flipped classroom teaching**

### ***6.1. Coordinate online and offline learning***

From the beginning of the birth of flipped classrooms, teachers record the knowledge teaching in class into micro-videos, organize students to watch micro videos through the Internet and other information technologies, complete learning tasks or generate problems, and then achieve learning goals through targeted questions and doubts in class. Therefore, online and offline is a process of mutual complement and integration, and the two should not be separated.

### ***6.2. Coordinate pre-class and classroom learning***

Flipped classroom highlights the students' pre-class learning link, extends the classroom, and changes the disadvantages that traditional teaching relies too much on classroom teaching and homework, thus truly implementing the teaching concept of "student-centered". The flipped classroom should coordinate pre-class and classroom learning to optimize the teaching process, and transform pre-class learning as inquiry and preparation as the basis for measuring the success of learning. The communication and sublimation of classroom learning should be taken as the key to changing the traditional classroom mode of teacher listening and it is necessary to take after-class learning as the consolidation and extension to become the link of students' independent learning [5].

### ***6.3. Coordinate the learning objectives and resources***

Flipped classrooms can more effectively implement the fundamental task of moral education and education, and integrate the requirements of comprehensive development of moral, intellectual, physical, aesthetic and labor in teaching. For example, PTCM teaching should highlight the cultivation of professional quality, technical skills and medical spirit. Teachers can allow students to independently collect learning materials before class according to the learning tasks with the help of flipped classroom. They can also carry out technical skills and innovative and entrepreneurial practice after class, so as to achieve the goal of advanced education concept in the "Internet +" era.

## **7. Conclusions**

Under the current diversified educational methods and educational thinking in the "Internet +" era, the teachers of traditional Chinese medicine colleges and universities should keep pace with the Times, and use the emerging teaching modes such as flipped classrooms in their own teaching according to the

actual teaching needs. This requires relevant teachers to give full play to the advantages of flipped classrooms, correctly treat and seriously overcome the problems in the process of implementing flipped classrooms, and improve the teaching process and teaching effect evaluation of flipped classrooms in continuous practice so that the teaching mode of the flipped classroom can truly serve the classroom teaching of Chinese pharmacy.

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