



# A Probe into the Strategy of Implementing Flipped Classroom Teaching Model in Agricultural Courses

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**Abstract:** With the integration and development of information technology and education, the flipped classroom teaching model has been popularized and applied in many colleges and universities, and it has become a prominent highlight of my country's higher education reform. Based on the analysis of the shortcomings of the traditional teaching methods of agricultural courses and the advantages of the flipped classroom teaching model, this article explores and constructs a flipped classroom teaching model for agricultural courses. It also discusses the implementation strategies of the flipped classroom model from the aspects of teaching philosophy, video material preparation, classroom activity organization, assessment and practical teaching, etc., aiming to improve the teaching effect of agricultural courses.

**Keywords:** Introduction to Agronomy, flipped classroom, teaching model

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Agricultural production is the process by which humans use the life activities of animals, plants, and microorganisms to obtain products. The agricultural courses mainly teach the research results of the growth and development of biological organisms, which are biological, complex, comprehensive and practical. Because most students lack perceptual knowledge of crop production before class, the traditional teaching methods instilled in classrooms are always difficult to achieve the desired teaching effect. After completing the course, students just memorized some basic concepts and basic theories by rote. The teaching goal of systematically mastering and flexibly using the knowledge learned has not been achieved. Therefore, it is particularly important and urgent to reform the teaching model of agricultural courses, and it is of practical significance to explore and study the flipped classroom teaching model of agricultural courses.

## 1. Problems in the traditional teaching of agricultural courses

### 1.1 Inverting the main body of teaching and learning

Judging from the current actual situation of teaching in agricultural colleges and universities, many teachers still use speech indoctrination teaching methods under the influence of traditional educational concepts, taking their own teaching as the main body, and have a strong sense of controlling the classroom. Although multimedia teaching is also used, which increases the amount of information, eases the contradiction of less time and more content, and enhances intuition and interest, the essence of the teacher's exclusive classroom has not completely changed. The teaching method has changed from "chalk + blackboard" to "computer + projection", and students' attending classes have changed from "notes" to "screen shots on mobile phones." Although sometimes they also use heuristic teaching methods to interact with students through questioning, generally speaking, students completely obey the teacher's arrangements, passively receive information, and have no autonomy, and the student's main role is not fully exerted.

### 1.2 Insufficient training of personalization ability

When teachers teach agronomy courses, they pay attention to the teaching of basic concepts and basic theories, and test students' learning effects mainly based on their mastery of knowledge points, and guide students to analyze and discuss practical problems in agricultural production. Insufficient attention is paid to the cultivation of innovative ability, discovery and problem-solving ability. In addition, the class or grouped classes are focused on class, the teaching content and teaching progress are unified, it does not take into account the differences in students' personalities, cannot meet the needs of different students, and fails to teach students in accordance with their aptitude. At the same time, there is a serious shortage of practical teaching. The only few experimental classes are often just speculations and mere formalities. They have little effect on students' consolidation of internalized knowledge and cannot effectively improve students' ability and quality. In addition, students have problems such as lack of initiative in learning, inconsistency in classroom learning, and low efficiency, which lead to insufficient knowledge of students <sup>[1]</sup>.

### **1.3 Insufficient information technology level of teachers**

The integration of information technology and education and teaching puts forward higher requirements for teachers' teaching ability. In addition to completing basic teaching tasks, it is also necessary to continuously develop curriculum resources through the accumulation of practical experience, give full play to the advantages of network information, and improve teaching. Effectiveness. However, teachers still have many shortcomings in terms of information literacy. They not only lack proficiency in the application of information technology, but also cannot produce high-quality teaching courseware according to the actual needs of teaching. Some of them use information technology on the surface, but they do not improve teaching. The effect of the effect.

## **2. Analysis of the advantages of the flipped classroom teaching model**

The flipped classroom teaching model is to flip the teaching of knowledge to before class. Students use their spare time to independently choose time and space to learn the lecture micro-videos and learning materials provided by the teacher, interact with classmates and teachers on the network platform, and complete the teacher layout Learning tasks such as self-test exercises, problem thinking and exploration, realize the understanding and mastery of knowledge. Under the guidance of the teacher, the students in the class conduct group discussions around real problems derived from the course knowledge, and collaborate to complete creative assignments. Through sharing and communication, display of results, Q&A and mutual evaluation, speeches, debates and other forms, the internalization and absorption of knowledge is achieved. The advantage of this model is that it changes the subject relationship between teaching and learning, embodies the new teaching concept of "student-centered", and mobilizes students' enthusiasm and initiative in learning. Classroom teaching is no longer boring and monotonous, on the contrary, it becomes lively and interesting. Classroom becomes a field for students to solve problems, exchange ideas, stimulate wisdom, and promote development, which is very conducive to the cultivation and improvement of students' high-level abilities such as innovative thinking, analysis and problem solving. At the same time, students can play the course videos and online course resources repeatedly according to their own conditions during pre-class study, which solves the learning problems of personality differences in a targeted manner, and comprehensively improves the learning effect of all students<sup>[2]</sup>. Therefore, the flipped classroom teaching model has been respected by all levels of education in our country, and has become a prominent highlight of higher education reforms.

## **3. Construction of flipped classroom teaching model for agricultural courses**

After the introduction of the flipped classroom teaching model to my country, many scholars conducted exploration and practice of the construction of a "localized" model based on my country's education situation. Zhang Jinlei proposed a flipped classroom model consisting of six parts: problem determination, environment creation, independent exploration, collaborative learning, exchange of results, and feedback evaluation<sup>[3]</sup>. Guo Jianpeng innovatively proposed the O-PIRTAS universal model, including seven links of goal, preparation, teaching video, review, test, activity and summary<sup>[4]</sup>. These models have been verified in practice, and they all have their own outstanding advantages.

On the basis of learning and drawing on the research results of flipped classrooms by many scholars, combined with the talent training goals of higher agricultural colleges and the characteristics of agricultural courses, the research and construction of agricultural flipped classroom teaching models are made. This model constructs a flipped classroom teaching model from the two levels of curriculum and teaching, and divides the entire teaching activity into two stages, namely the preparation stage and the implementation stage. The preparation stage includes seven parts: teachers determine course objectives, arrange teaching content, prepare teaching resources, record micro-course videos, design classroom activities, formulate evaluation and assessment plans, and investigate and practice students. The implementation phase is divided into three modules: pre-class, in-class, and after-class. Each module constructs the key links for implementing flipped classrooms from the two dimensions of teachers and students. Teachers assign learning tasks before class, students learn video materials independently, complete knowledge cognition, teachers ask questions and answers during class, students collaborate to discuss, share and display, interact with each other, and realize knowledge internalization; after class, it is improved through practical reflection and innovative application. Metacognitive ability. This model is not only conducive to students' learning and mastering of agricultural production theory and technology, but also focuses on the cultivation of students' high-level thinking ability and high-level cognitive goals, clarifying and reflecting the essence of the "learning-centered" flipped classroom.

## **4. The strategy of implementing the flipped classroom teaching model for agricultural courses**

### **4.1 Change teaching concepts and improve teaching ability**

The flipped classroom teaching model flips the time and space of the classroom, teaching process, teacher-student relationship, and most fundamentally flips the essence of learning<sup>[5]</sup>. First of all, teachers must establish a "student-centered" teaching philosophy. Each link of teaching design, classroom activities, and teaching practice should be based on students, all from the perspective of conducive to students' learning, and give play to students' subjective initiative. In and out of class, actively interact with students, and grasp the behavior of teachers in accordance with the roles of answerers, guides, and evaluators. Secondly, improve teachers' comprehensive teaching ability. The flipped classroom teaching model puts forward higher requirements for teachers. Teachers must not only be proficient in the content of the course, and put forward the problems faced by agricultural production in combination with the actual situation, but also learn to use information technology to record course micro-videos, make courseware, and learn to communicate with students through the network platform. Interactive communication, aiming at the characteristics of flipped classrooms, improve classroom discussion organization, control, and problem management skills. Colleges and universities should organize and carry out relevant teaching skills training to continuously improve teachers' teaching ability to adapt to the flipped classroom. At the same time, students must change their roles, change passive learning to active learning, adapt to the teaching method of flipped classrooms as soon as possible, actively participate in classroom activities, and strive to improve learning effects.

### **4.2 Refined video courseware to optimize teaching resources**

The flipped classroom model actually implements knowledge transfer through online and offline hybrid teaching methods. The quality of video courseware provided by teachers directly affects students' learning interest and learning effect. In view of the biological, comprehensive, and practical characteristics of agricultural courses, when recording video courseware, teachers should not only use a large number of pictures and videos to display, but also use animation technology to interpret the content of the course to enhance the interest and vividness. , Improve students' interest in learning and help students understand memory. According to students' cognitive laws, the recorded video should generally not exceed 15 minutes. At the same time, teachers should actively develop teaching resources, select, process, decompose, and integrate various teaching resources in terms of learning content and methods, knowledge application, and ability improvement, so as to ensure that every class recommended to students is high-quality, reducing students' Cognitive burden, improve learning efficiency<sup>[4]</sup>. In addition, it is necessary to make full use of online resources of national top-quality courses, strengthen contacts with well-known domestic universities such as China Agricultural University and Northwest A&F University, establish a teaching resource sharing platform, promote cooperation and exchanges between university teachers, and achieve the goal of win-win improvement.

### **4.3 Simultaneous supervision and motivation to guide independent learning**

Existing studies have shown that in the teaching practice using the flipped classroom model, students' autonomous learning ability and learning consciousness have a great influence on the learning effect [6-9]. In response to the problem that some students did not study video materials carefully before class, individual students recorded the learning time on the network platform, and the video only played but did not learn. Teachers should strengthen supervision and inspection in a timely manner through the learning platform, score and evaluate students' study time, self-test scores, question thinking and communication, praise the advanced, spur the backward, and encourage students to consciously complete the task of independent learning. At the same time, students are required to make and upload study notes from two aspects: knowledge points and personal thinking. Students can browse study notes and exchange learning experiences and experiences with each other. Teachers promote good learning methods through praise and encouragement, consciously cultivate and improve students' independent learning ability, guide students to choose the most suitable learning method according to their own cognition and learning ability, and arrange their own learning rhythm.

### **4.4 Create teaching situations and enrich classroom activities**

Compared with the traditional teaching model, the flipped classroom teaching model uses a lot of classroom time to organize and carry out diversified activities of internalized knowledge. The effect of flipped classroom teaching depends on the design and implementation of classroom activities, as well as the play of the main role of students. Therefore, teachers should design the specific form and target requirements of each classroom activity according to the content of agricultural courses, and guide students to actively participate in the implementation. For example, in the "Introduction to Agronomy"

class, in order to cultivate and improve students' innovative thinking ability, after students have learned the content of crop production technology before class, students are organized to carry out an exploratory discussion activity on "How to solve the problem that watermelon can not be replanted". Teachers guide students First, analyze the reasons why the watermelon can not be planted continuously, and then discuss the solutions from the technical research of breeding and cultivation for the reasons. After learning the content of crop yield components, let students design a "wheat field measurement plan" in groups to cultivate students' sense of cooperation and improve students' knowledge application ability. In order to mobilize the enthusiasm of students to participate in classroom activities, teachers can use competitive incentives to allow students to actively think, actively communicate and display their own exploration results. In view of the problems of individual students who are not active or serious in group activities, and take a ride, teachers can take the method of randomly selecting group members to report, linking individual scores with group scores, and urging every student to actively participate in classroom activities.

#### **4.5 Strengthen practical teaching and promote knowledge transfer**

Agricultural sciences are highly practical, and need to further interpret theoretical knowledge through practice to deepen students' understanding of knowledge. In view of the lack of perceptual understanding of crop production by most students, first put part of the practical teaching content before class. Students can use field observation to understand the morphological characteristics, growth and development of different crops, and help students learn by video before class. At the same time, in the pre-class practice, students also understand some production problems, which will play a positive role in stimulating students' interest in learning. Practice after class is an effective way to consolidate and improve the knowledge learned, and it must be highly valued. On the basis of pre-class video learning, teachers can lead students to planting bases, rural fields, etc. to carry out practical teaching, allowing students to observe and operate agricultural activities. For example, in the course of "Introduction to Agronomy", when teaching the growth and development of crops, students are allowed to conduct seed germination experiments by themselves, observe and record the germination process of seeds, and then consider and discuss the selection of crop sowing conditions and sowing dates. After the course is over, organize students to go to the countryside to investigate the planting system, use the knowledge they have learned to study and analyze the problems of the survey objects in crop layout, planting technology and other aspects, and put forward countermeasures and suggestions. These practical activities are not only the transfer of the theoretical knowledge of agricultural production, but also the test of the learning effect of the course.

#### **4.6 Reform the assessment method and give full play to the incentive orientation**

The evaluation method of student's course performance has obvious stimulating effect on student's study. The traditional teaching model focuses on examining students' mastery of basic theories and concepts. Students' final exam scores generally account for about 70% of the course scores. Students have developed a learning habit of taking notes in class and memorizing notes before the exam. The flipped classroom teaching model focuses on the improvement of students' ability and quality, and the focus of evaluation and assessment should be placed in normal times, so as to motivate and mobilize students' initiative and enthusiasm in learning. Therefore, instructors must formulate a course assessment and evaluation system that complements the flipped classroom, which combines formative evaluation and summative evaluation. The design includes pre-class independent study, classroom discussion, group collaboration, task completion quality, sharing of display effects, and practical skills. , The dynamic whole-process evaluation standard, including test scores, adopts the evaluation form of teacher evaluation, student mutual evaluation, and self-evaluation to achieve a comprehensive and objective evaluation of students' academic performance. At the same time, teachers can also try to use the combination of open test questions and closed-book examinations according to the characteristics of agricultural courses to examine students' abilities from multiple levels and guide students to develop good study habits.

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