Research on Flipped Classroom Teaching Mode Based on MOODLE

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Abstract: A flipped classroom teaching mode based on MOODLE was proposed in this paper. Teaching video, exercises before class, activities in class and practice after class were designed in the mode. Most students recognized that the flipped classroom teaching mode was different from the traditional mode and it was effective and acceptable.

1. Introduction

With the rapid development of information technology, requirement is higher and higher for graduates' capability of using the information. And in the current Chinese higher vocational colleges, the students' original knowledge is different, but teaching methods are uniform. More and more course content is taught, but students' learning interest is not strong,and classroom atmosphere is gloomy. Truancy phenomenon is serious in some colleges. Less interaction between teachers and students is also one of the problem. Therefore, the reform of traditional teaching mode and teaching structure has become the focus of many educators, and the flipped classroom teaching mode appears to change the traditional teaching mode into a new vitality.

With the popularity of the Internet and smart mobile devices, E-learning technologies promote the education reformation[1]. By using the affluent E-learning resources on the Internet, personal learning styles for learner is built easily. Individual teaching method can be used in the classroom, and teachers have more time to conduct individual guidance. Students do better in personalized learning, active learning and autonomous learning. Open source network teaching system can be easily obtained. All of this provides a feasible and realistic basis for the effective implementation of flipped classroom teaching mode.

2. Flipped Classroom Teaching Mode Theory

2.1 Mastery Study Theory.

Bloom's mastery study[2] strategy proposed that as long as there is enough time and proper teaching, most students can master the content of nearly all of the requirements of the study. The knowledge is divided into many small targets, and further subdivided into small units, and finally to the point of knowledge. Teachers need to prepare some levels of test questions. Students will continue to learn if they meet the requirements. If the student does not reach the goal, he will continue to learn the same point of knowledge until he has passed the test.

The flipped classroom teaching mode is designed based on mastery study theory. Before class according to their own learning situation,students watch the teaching video alone. Teachers design and record each video carefully according to the knowledge point. Test questions of varying difficulty levels are designed for each video.Students can learn in a relaxed environment and there is enough time to learn. Students can fast forward, backward and pause the video,so they can repeat learning the knowledge.They can also mark the difficult point and seek help.

2.2 Constructivism Theory.

The theory of J.Piaget's Constructivism[3] proposed that when learners acquire knowledge, they often have not only to their own initiative to it, but also needs the help of others to find the

necessary variety of information, access to knowledge in the outside world to interact with the object.In the process of teaching, the students are placed in a central position to actively promote them learning, enabling them to build their own knowledge. According to the teaching content, the teachers create the problem situation. Students should take the initiative to construct knowledge, learn to use various resources to analyze problems, solve problems, so as to achieve the meaning of knowledge construction. The existing knowledge and experience of the learner will have a certain effect on the acceptance of new knowledge. Before put the flipped classroom teaching mode into practice, teacher must first understand the basic situation of the students, then according to the teaching content and teaching objectives, carefully designed teaching activities, choose appropriate teaching strategies, truly individualized. Teachers organize students to carry out group cooperative learning, the formation of "learning community" learning environment, so that students get a comprehensive development. Teachers bridge links in the connection between old and new knowledge for students in the proper way at the right time, help them construct knowledge in diverse conditions and environment, cooperation and exchange, to create opportunities for them to construct knowledge more complete and more effective. The flipped classroom teaching mode is based on constructivism. In the mode, the students as the protagonist, the teacher as a supporting role, to build a proper environment, so that students can truly autonomous learn or meaningful dialogue with the peer interaction, and ultimately to achieve the meaning of knowledge construction.

2.3 Talbert's Mode.

Professor Talbert proposed a structural model for the implementation of the flipped classroom[4], as shown in figure 1.He suggests that the teaching model of the flipped classroom should include two parts: before class and in class.Before class, students watch the video to learn knowledge, and then do exercise.In class,students do the test first, then discuss with the teacher or other students in a team; finally, make a summary.
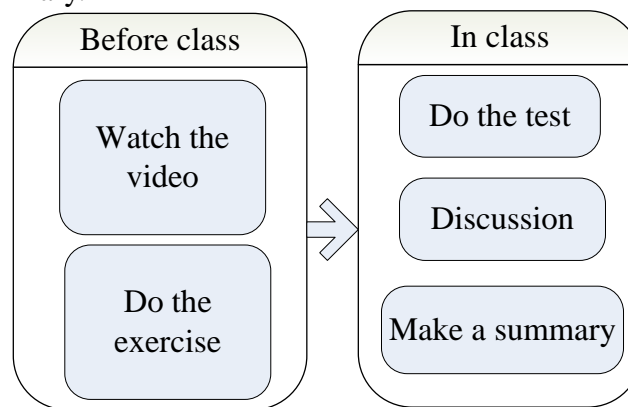

Fig.1.Talbert's Mode

3. MOODLE Platform

The function of MOODLE system mainly includes three aspects: administrators, teachers and students.

Administrator is responsible for the management and maintenance of the entire MOODLE platform, it includes the system configuration, user information management, home settings, create a new curriculum, the appointment of teachers and other management functions as show in figure 2.
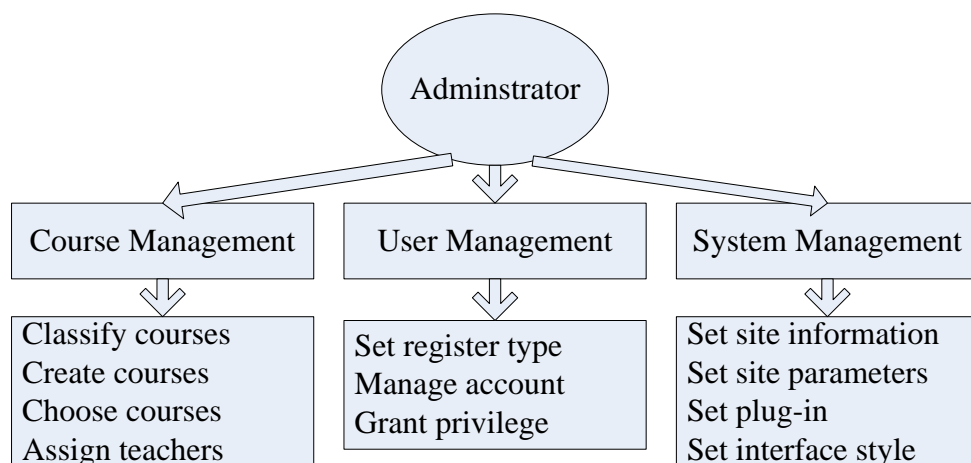
Fig.2.The Functions of Administrator in MOODLE

The teacher is responsible for teaching design, preparation, implementation, evaluation and feedback of the work. Teachers play a leading role in the teaching process. Teachers can add and modify the curriculum according to the teaching practice. According to the teaching task and various parameters on the curriculum, learning module can be modified to meet the needs of study. Teachers should be good at teaching process of teaching management, view the log, answer the questions raised by the students and read the report as show in figure 3 .
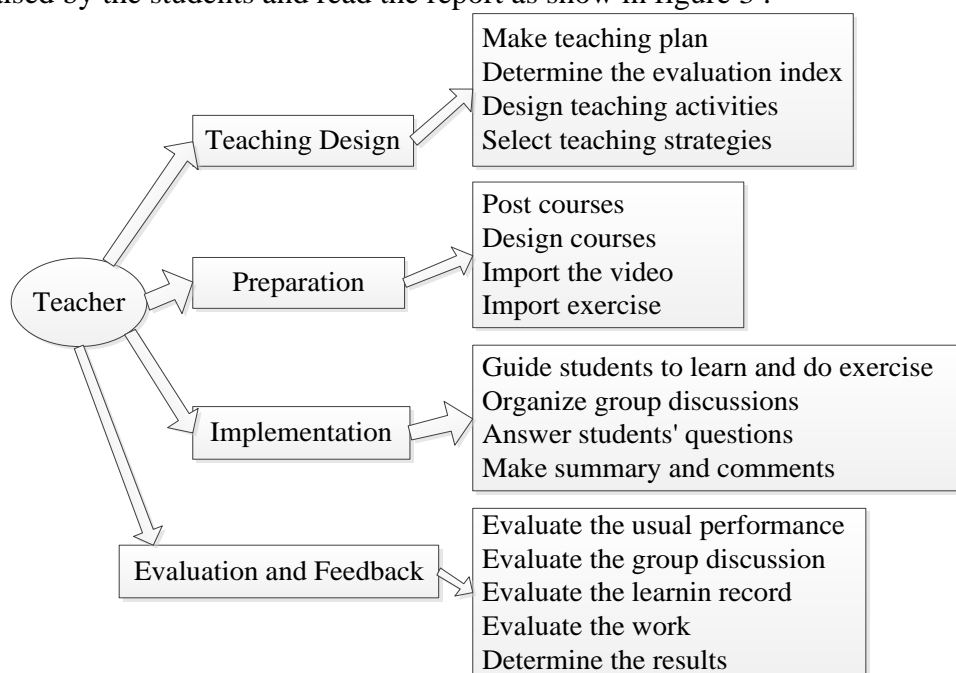

Fig.3.The Functions of Teacher in MOODLE

Students can download the resources on the platform to learn. And they can also upload their work to share works resources. Students participate in the discussion of the course through the platform. If the students have problems, they can ask the teacher at any time. They can read news and do the exercises. They may record their learning problems and thought in the network. Formative assessment was made in the learning process of the course and evaluation was made at the end of the course.

4. Flipped Classroom Teaching Mode Based on MOODLE

Based on the research of the flipped classroom theory and the characteristics of computer courses in higher vocational colleges in China,a structural model for the implementation of the flipped classroom in higher vocational colleges is designed in the Moodle platform,as shown in
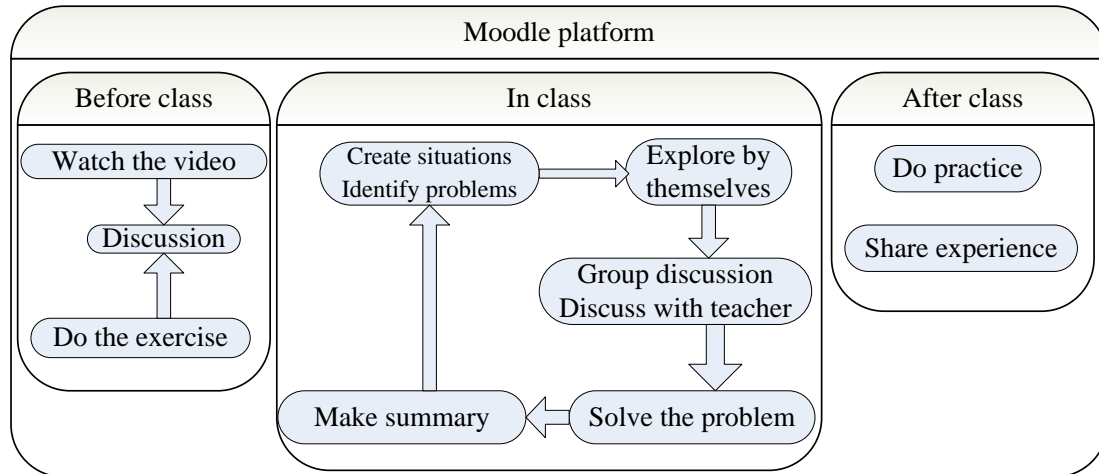
figure 4.

Fig.4.Flipped Classroom Teaching Mode Based on MOODLE

4.1 Teaching video.

Before the class, the students can learn by themselves through the teaching video provided by the teachers on the Moodle platform.Instructional video can be recorded by the teacher, but also can be the more outstanding educational resources on the internet like the Harvard University and Yale University open courses, some courses of Khan Academy[5], Chinese national excellent course etc..The teacher can use the video resources which match the teaching objectives as the teaching content of the course to improve the use rate of the excellent teaching resources.According to the specific teaching objectives and the characteristics of students,teachers can also record their own teaching video with their own teaching experience. Teachers should consider the visual effect, highlight the difficulties and pay special attention to the length of the video that the general video lasts about 20 minutes.Comments can be added in the video.

4.2 Exercises before class.

Students not only watch the video, but also do the exercises before class. Exercises are designed by teachers, put on the Moodle platform, in order to deepen the understanding of the knowledge. The teacher should consider the difficulty and quantity of exercises carefully before the class. The Moodle platform provides the discussion area and chat rooms to communicate with each other.

4.3 Activities in class.

The teacher should design effective classroom learning activities according to the students' learning situation before class.

First of all, teachers create situations, identify problems. Students choose the appropriate title on the basis of their own interests. The students who choose the same question are formed together to be a group. Generally, the number of the group is about five students.The members of each group try to solve this problem independently.before the group collaborate to explore.Teachers guide and help students to develop a personalized learning program that they use learning tools for autonomous collaborative learning. Collaborative learning mode plays an important role in cultivating students' critical thinking and innovative thinking. The teacher should guide the group collaboration and interactive learning. Teachers should always pay attention to observe the performance of each student and give the guidance of the students with difficulty to make the classroom activities carried out smoothly. After the students have finished the discussion and solved the problem, they need to exchange the results in the classroom.Finally,teachers carry out a summary and evaluate the students about the learning process. Teachers should evaluate a single person and the entire group separately.

4.4 Practice after class.

Students should continue to consolidate knowledge after class。They can do the development of practice. Teachers organize all of the group works to share in the MOODLE platform.

5. Questionnaire Analysis

Table 1 Analysis of student acceptance

Question	Answer	Number	Percentage
Do you like the flipped classroom teaching mode based on MOODLE?	like very much	66	13%
	like moderately	381	76%
	moderate	39	8%
	dislike moderately	14	3%

Table 2 Analysis of the validity

Question	Answer	Number	Percentage
Do you think the flipped classroom teaching mode is effective?	Strongly Agree	187	37%
	Agree	261	52%
	Neutral	48	10%
	Disagree	4	1%

Table 3 Analysis of the difference

Question	Answer	Number	Percentage
Do you think the flipped classroom teaching mode is different from the traditional mode?	Strongly Agree	124	25%
	Agree	226	45%
	Neutral	106	21%
	Disagree	44	9%

After constructing and practicing the teaching mode in Suzhou Polytechnic Institute of Agriculture, the results of questionnaires were shown in Table 1, Table2 and Table3.It indicates that most students recognize that the the flipped classroom teaching mode is different from the traditional mode and the mode is effective and acceptable.

6. Conclusion

Flipped classroom teaching mode based on MOODLE is effective in Suzhou Polytechnic Institute of Agriculture. Teaching video, exercises before class, activities in class and practice after class are designed in the mode. It serves as an approach to course reform of higher vocational education in China..

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