

Comparative Research on the Application of Traditional Classroom Teaching Model and Flipped Classroom Teaching Model

—Taking Modern Educational Technology Course as an example

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Abstract—With the development of education informatization, the teaching model reform has aroused widespread attention from educators and researchers. The flipped classroom teaching model is one of the emerging ICT-supported teaching models. This paper analyzed the differences and connections between traditional classroom teaching model and flipped classroom teaching model, and conducted an experiment employed the two teaching models to compare the teaching effects. The teaching effects were evaluated by the skill test and students' interview. The results showed that flipped classroom teaching model could improve students' enthusiasm and stimulate students' self-directed learning.

Keywords—traditional teaching; flipped classroom; teaching model

I. INTRODUCTION

The National Medium and Long Term Program for Education Reform and Development (2010-2020) put forward a blueprint of education reform, which requires improving the quality of talent cultivation and establishing the center position of talent cultivation in higher education for deepening education reforms. Specifically, it points out that educational reform should make use of the advantages of information technology [1]. In addition, the Ten-year Development Plan of Education Informatization (2011-2020) states that we should promote deep integration of information technology and high education and innovative talent cultivation model. More specifically, it points out that we should speed up digitalization reconstruction of profession and curriculum, and promote the innovation of teaching model and learning method [2]. Obviously, the two programmatic documents issued by the state government clearly define the urgency and necessity of education and teaching reform enhanced by information technology.

The Ministry of Education published the Guidelines of Transitional Development for Local Universities, which stated that local universities should focus on application and practical skills in terms of talent cultivation [3]. It is acknowledged that flipped classroom teaching model is a kind of new teaching

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model that emphasizes the students' role in the classroom, and provide students with opportunities to improve skills and ability to apply knowledge [4].

II. THE DISTINCTION AND CONNECTION BETWEEN TRADITIONAL CLASSROOM TEACHING MODEL AND FLIPPED CLASSROOM TEACHING MODEL

A. Traditional classroom teaching model

As everyone knows, the traditional classroom teaching model is comprised of several stages, including reviewing old lessons, introducing new lesson, consolidating new lesson, and arranging homework. The biggest characteristic of traditional classroom teaching model is that teachers transfer knowledge to students, and students passively receive it [5]. Teachers always teach knowledge by telling and writing, and students always listen and take notes. Nowadays, traditional classroom teaching model is still the main teaching method in education, since traditional classroom teaching model makes teacher a dominator, which is beneficial to organize and manage the class. However, with the development of information technology, traditional classroom teaching model has faced with some challenges. One of the major challenges is that student's subjective initiative could not be completely released and the ability of independent innovation might not be cultivated very well. The challenges seriously restricted the cultivation of learning ability and do not conform to the new demands of talents cultivation under the rapid development of the society.

B. Flipped classroom teaching model

Flipped classroom teaching model is a hybrid teaching model, which emphasizes the participation of students and interaction of teachers and students [6]. In flipped classroom, students watch online lectures, collaborate in online discussions, or carry out research at home and engage in concepts in the classroom with the guidance of the instructor [7]. Specifically, the precious time in class will be used by students to concentrate on active study based on task driving. They can do some research together to solve problems in order

to understand course better. Teachers no longer take class time to teach knowledge and students need to complete autonomous learning before class. With educational technology, they can watch videos, listen to report, read e-books, discuss on line, and look for information at any time. Teachers can also have more time to communicate with everyone. After class, students plan their own learning content, learning rhythm, learning style, and the way of presenting knowledge. Teacher will meet students' personalized needs by teaching and collaboration method. The ultimate goal of flipped classroom teaching model is to enable students to obtain more realistic learning by practice. To sum up, the flipped classroom teaching model intentionally shifts instruction to a learner-centered model in which class time explores topics in greater depth and creates meaningful learning opportunities.

C. Distinction and connection

There are some distinctions and connections between traditional classroom teaching model and flipped classroom teaching model. Compared with traditional classroom teaching model, flipped classroom teaching model provide more specific teaching information. It emphasizes the reconstruction of students' learning process, which make it more convenient for students to review knowledge and evaluate themselves. However, flipped classroom teaching model gives students too much liberty in learning. Whether students' consciousness and initiative can catch up with learning process is not sure. In addition, teachers' heavy workload after class and quantization of teaching effects are serious problems. Hence, both traditional classrooms teaching model and flipped classroom teaching model have their advantages and limits. In this paper, the author selects a part content of "Modern Educational Technology" to apply the two models, and analyze teaching effects by experimental research.

III. THE DESIGN AND IMPLEMENTATION OF EXPERIMENT

A. Introduction of Modern Educational Technology Course

"Modern Educational Technology" is a compulsory course for undergraduate students in order to improve students' ability of applying information technology. The vast majority of domestic universities have opened Modern Educational Technology Course. As a local normal college, our college set up Modern Educational Technology Course for the normal undergraduates. This course consisted of 32 class hours, 16 class hours for theory and 16 class hours for experiment. Theory teaching mainly introduces the instruction theory, learning theory, communication theory and knowledge and skills related to modern educational technology. Experimental teaching is divided into 8 experiments: the use of scanner, gathering and processing graph and picture, audio media technology, video media technology, making deformation animation by flash software, making track animation and mask animation by flash software, the use of PPT software, designing and making of the courseware. This paper selected the second experiment, namely, gathering and processing graph and picture, to apply the two teaching model.

B. Needs analysis and feasibility analysis

From the perspective of the selected teaching content, gathering and processing graph and picture reflect the theoretical and practical application in Modern Educational Technology Course. The specific teaching content includes the basic knowledge of graph and picture, image principle, gathering method of graph and picture, and skills related to gathering and processing graph and picture. The theoretical knowledge and experimental skills are not independent with each other. On the one hand, students could deepen their understanding of the theory knowledge via practicing skills; on the other hand, students' skills might be promoted after learning the theory knowledge.

From the perspective of experimental teaching, students can obtain the basic gathering method of graph and picture, master image tone, color adjustment methods and image synthesis using Photoshop software by experimental learning. However, due to various conditions, many schools emphasized the theory and neglected the practice. It is necessary to strengthen students' practical ability through experiment, thus, the adoption of experimental teaching and exploration of reform on experiment teaching model is feasible.

C. Participants and treatment

This study selected the undergraduates majoring in geography, including two classes with 26 students respectively. Class one employed the traditional classroom teaching model, and class two employed the flipped classroom teaching model.

With regard to the control of experimental variables, first of all, we control that the irrelevant variables to ensure that the teaching time (45 minutes), teaching schedule, teaching content, teachers, teaching contents are exactly the same. The teacher is also the first time to teach the two classes, excluding students preparing in advance interference. Finally, the data of student's interview and test scores were collected to evaluate the teaching effects of the two teaching models.

D. Research design

Before the implementation of the study, it is necessary to design teaching content and give a clear time schedule. We designed the teaching plan for each class with the traditional classroom teaching model and flipped classroom teaching model respectively, as shown in Table 1 and Table 2.

At the end of the teaching process, we selected some students of two classes for interview with the combination of individual and group interview. Informal interview is mainly to learn about students' feelings in class, while formal interview is to answer the prepared questions. The interview can collect intuitive feedbacks on teaching effects, find and solve problems in a timely manner. Another way to know the learning effect is skill test via computer test after the course.

TABLE I. TRADITIONAL CLASSROOM TEACHING PLAN

| Time schedule | | Learning arrangement | Students' main task | Teacher' main task |
|---------------|--------------|----------------------|--|--|
| before class | | | | Preparing teaching plan |
| during class | 15 minutes | Listen | The students listen to the teacher | Teaching |
| | 20 minutes | Train | Train on the basis of teaching content | Observe the students' training |
| | 10 minutes | Questions | Ask questions on the basis of training | Answer the students' questions |
| after class | the next day | Strengthen | Skill training | Answer questions and inform the approach to review |

TABLE II. FLIPPED CLASSROOM TEACHING PLAN

| Time schedule | | Learning arrangement | Students' main task | Teacher' main task |
|---------------|--------------|-------------------------|--|--|
| before class | three days | Self-study | The material, micro-video, download learning resources | Sharing resources, arranging knowledge points |
| | the last day | Questions | Give questions in the curriculum group, answer questions each other with the help of teacher | Recording issues, give feedback |
| during class | 10 minutes | Cooperative learning | Packet and discuss learning content, give the question | Give the explanation and analysis for the common problem |
| | 20 minutes | Independent exploration | Answer the questions and solve difficult with the help of teacher | |
| | 15 minutes | Strengthen training | Targeted training | Give individual guidance to individual problems |
| after class | the next day | Strengthen | Skill training | Answer questions and inform the approach to review |

E. The experimenting and learning process

1) Preparation of the experiment

The teacher selected the teaching content and made teaching plan suitable for traditional classroom teaching model. Meanwhile, the teacher redesigned the teaching content according to the flipped classroom teaching model. The experiment teaching was carried out in a computer room equipped with multimedia devices.

2) Implementation of the experiment

The teacher adopted traditional classroom teaching model in class one. Teacher finished lecturing according to experimental teaching content, meanwhile, teacher presented knowledge assisted by multimedia audio-visual devices. Then, students used computer to finish operation and communicate with teacher about learning content. Finally, the experimental test was conducted.

At the same time, the flipped classroom teaching model was conducted in class two. Teacher had recorded micro video of the teaching content three days before the class. Each micro video had about three to five minutes according to knowledge division, and contained the detailed steps of teachers' operation and the corresponding lecture speech. Students mainly discussed in the classroom, solved problems with the teacher's help, and train skills according to the problems.

3) Evaluation of the experiment

The experiment results were collected mainly by students' interviews and skills test. The interview could collect students' feedbacks about their advices about teaching model, teaching content.

IV. RESEARCH RESULT ANALYSIS

A. Research results

According to interviews results, the students in class one had low learning interest, and had no independent consciousness. The students in class two had high learning enthusiasm because of self-study and task-driven teaching method based on problem solving. Additionally, students' submitted work after the class was used to test their skills, which were divided into four grades. Figure 1 shows the results of the skill test. According to Figure 1, the number of excellent works in class two is very high.

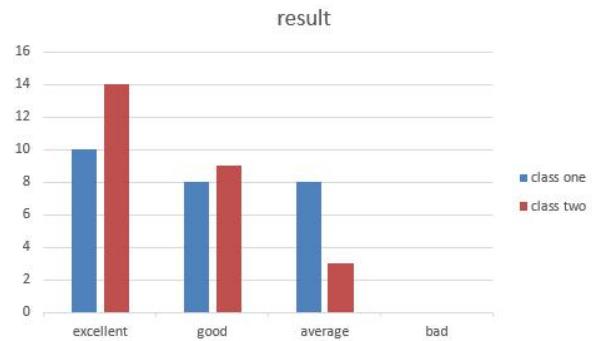


Fig. 1. Results of the skill test

B. Comparative analysis of the two models

According to the study results, compared with traditional classroom teaching model, flipped classroom teaching model helps students in personalized learning that learners can control their own learning progress according to their own learning style and ability and arouse their learning enthusiasm and motivation. It is good for cultivation of autonomous learning and cooperative learning abilities. It makes teachers liberate from repetitive work and allow teachers to discuss meaningful questions with students. To sum up, the flipped classroom teaching model can promote teaching that benefits teachers as well as students.

In this study, only the skill knowledge learning is selected to experiment with flipped classroom teaching model. The effects of flipped classroom teaching model for other kinds of knowledge need to be validated. Otherwise, for the success of flipped classroom teaching model, teachers are required to make a lot of efforts before class, while students should have independent learning ability. Therefore, traditional classroom teaching model has its necessity of existence.

V. CONCLUSION

With the development of multimedia computer and network technology, the traditional classroom teaching model faced with severe challenges. This study makes a comparative study on the teaching effects of the traditional classroom teaching model and flipped classroom teaching model. This study provides some enlightenment for teaching model reform of higher education. Due to the limitation of the course content and the sample size, more future researches still need to be carried out.

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