The Application and Innovation of Flipped Classroom in the Teaching Management of Colleges and Universities under the Background of "MOOC"

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Abstract: Without scientific and reasonable teaching management, we can not guarantee the teaching order and quality of the school. The purpose of this paper is to study the application and innovation of flipped classroom in the teaching management of colleges and Universities(CAU) under the background of "MOOC". This paper summarizes the teaching of MOOC, the teaching management of flipped classroom and the significance of flipped classroom teaching management combined with MOOC education in CAU. Based on this, this paper studies the innovative methods of teaching management. The experiment was carried out in class 1 and class 10, grade 4 of a City University. The results showed that the average score of high number in the experimental class was 91.523, the average score of high number in the control class was 87.477, and the difference of the average score was 4.0455. It shows that the flipped classroom teaching management model is helpful to improve students' academic performance. The results of the two classes are relatively good and meet the experimental conditions.

1. Introduction

The reform of the education sector is also advancing with the times. The application of classroom information technology breaks through the education and learning mode of teachers and students in the past, and brings new challenges and opportunities to the education field. The goal of university education is to combine information technology and educational content, improve students' enthusiasm for learning, and students' innovative ability and spirit.The construction of higher education curriculum effectively cultivates students' enthusiasm for learning, gives full play to students' learning subjectivity, and enables students to learn independently.

The flipped classroom based on MOOC education brings new vitality to university teaching. MOOC education provides a platform for college students to learn resources and shortens the communication and interaction between teachers and students. In the flipped teaching mode, college teachers can answer the questions of teaching materials for students. The combination of MOOC education and flipped teaching mode can promote students' learning enthusiasm, give full play to students' learning subjectivity, and enable students to learn effectively according to their own characteristics.

It is a challenge to create an online teaching project management course in a completely online distance learning environment. Working with adult learners from different continents who want to complete a master's degree is an additional challenge. Rita Falcao describes how to use different MOOCS to learn and teach (meta) e-learning. MOOC provides a variety of opportunities for teachers to learn and innovate in e-learning. Through the analysis of five MOOCS in the field of project management, they learned how to build content, how to prepare complex assignments and how to help students learn important courses. It describes how they learned from MOOC to become better online teachers [1]. W Liu used three different datasets to evaluate the flipped classroom teaching method. In addition to the regular course assessment and test results over the past three years, the student assessment of "flipped classroom" is used in particular for statistical comparison. Overall, the results were quite positive. Among these interesting effects, the students reported that they had made better preparation for the speech, were more satisfied with the course as a whole, and achieved slightly better results, with fewer students with very low scores [2].

The innovation of this paper: the current research on MOOC and flipped classroom mainly

focuses on the teaching mode of flipped classroom, the construction of flipped classroom teaching platform, the practical application of flipped classroom, the effectiveness of MOOC, the multiple evaluation of MOOC, and so on. However, there are few systematic research programs on how to manage flipped classroom. The starting point of this paper is to explore a management model suitable for flipped classroom teaching in CAU, standardize the scientific nature of school teaching,and promote the development of educational information.

2. Proposed Method

2.1 MOOC Education and Teaching

MOOC education has changed the previous education concept, teaching content and teaching methods. MOOC education refers to large-scale online teaching video open class [3]. Online MOOC education is to use information technology to publish school teaching materials to the Internet, and provide them to students and learners for learning and sharing. MOOC education is a new teaching method combining educational technology and information technology [4-5].

2.2 Teaching Management of Flipped Classroom

The first is to set teaching by question to ensure teaching. The flipped classroom model weakens the traditional classroom system. In the teaching management of the teaching activity group, it is better to divide the students with the same interests and hobbies into a classroom cooperation group, and the number of students is less than or equal to 5. According to the difficulty of the problem, ask the team members to complete the task together. The combination of the course design mode of "asking and teaching" and group cooperation and exploration can cultivate the team spirit and management consciousness of students' cooperation and cooperation. It realizes the seamless connection between traditional teaching management and flipped classroom teaching management [6].

The second is to improve teachers' comprehensive ability and ensure education management. The requirements of flipped classroom for teachers' ability far exceed the requirements of traditional classroom management ability. Because of its new exploration, development and interaction, flipped classroom teaching management pays more attention to teachers' ability to deal with emergencies, the ability to capture temporary teaching opportunities and sensitivity [7-8]. The most direct embodiment is that teachers have the best teaching effect on different students, different knowledge points, what kind of teaching methods and means they use, which requires teachers to make judgments in a short time. It can be seen that flipped classroom teaching management requires teachers to have high scientific research ability, adaptability and good communication ability. Therefore, from the aspects of scientific research ability and activity organization ability, the school actively carries out the cultivation of management ability of rotating classroom for teachers of different majors and grades [9].

Only when the traditional classroom teaching management experience and scientific methods are innovated creatively and critically, can they be applied, stimulate students' interest in independent learning and free inquiry, and improve the application effect of flipped classroom.

2.3 Flipped Classroom Teaching Management Combined with MOOC Education in CAU

In flipped classroom teaching, college teachers need to give students enough time to study independently. Teachers consult teaching materials, complete report teaching, give students enough time and necessary hardware facilities, and complete the education tasks left by teachers [10]. When students independently complete the report teaching task, CAU should arrange guidance teachers for students, and teachers should do a good job of corresponding guidance, so as to maximize the absorption of teaching courses and improve the quality of students. In addition, from the perspective of the quality of teaching video production, good teaching video can help students learn well, and it is an auxiliary tool for students to learn. But bad education videos can backfire. Therefore, when making educational videos, teachers should combine the contents of teaching materials made by the

school with the educational resources of MOOC, so that students can easily understand the knowledge of the book, thus being full of interest in learning and achieving the purpose of independent learning.

2.4 Innovative Methods of Teaching Management

Teaching link 1: straighten out knowledge. In this part, the teacher asks the students what knowledge they have learned from watching the micro class before class. On the one hand, the teacher tests whether the students watch the video carefully. On the other hand, the teacher helps the students review and sort out the knowledge content of this class, emphasizes the key and difficult points, and helps the students internalize the knowledge. At the same time, the teacher shows the knowledge structure chart to help students deepen the overall grasp of the content of this lesson [11-12].

Teaching link 2: to solve the doubts. In this part, students ask questions and teachers solve the learning difficulties encountered by students in pre class micro class video and pre class learning task list. Cultivate the habit of thinking actively. It deepens the construction of students' knowledge.

Teaching link 3: achievement display. Through the display of results, test the cognitive situation of students, in line with the principle of not coincident with the previous round of questions, give more opportunities for students to perform, let students truly feel the equal class status, feel the importance of exploration and cooperation, and cultivate team awareness.

Teaching link 4: Breakthrough of key and difficult points. This link is mainly to answer the key and difficult problems in the learning task list of students in the classroom. In this link, the teacher points out the problems found in the teaching tour and helps students to correct the wrong places of knowledge understanding.

Teaching link 5: multiple evaluation. In the process of knowledge learning, there are both cooperation and competition. Through self-evaluation, other evaluation within the group, and multiple evaluation methods of inter group selection, excellent students are selected to cultivate their active and enterprising sense of competition. Through observation, in line with the principle of fairness and justice, the teacher guides the students to vote for the learning star of this lesson.

3. Experiments

3.1 Experimental Subjects

In this study, two classes in grade four of B University in city a were selected as experimental class and control class. The number of students in the two classes was similar, and the overall mathematics learning level of the students was equivalent. In the fourth grade, the experimental class used the flipped classroom teaching management mode combined with MOOC education to intervene, while the control class continued to use the traditional teaching mode to teach, and measured the impact of independent variables on students' mathematics learning performance under the exclusion of the interference of unrelated variables such as transfer students, special students, examination leave and so on.

3.2 Experimental Method

Class 4 (1) is the experimental class, class 4 (10) is the control class, and the experimental class has a half semester flipped classroom teaching management experiment. The experimental process mainly includes the comparison of the two types of prediction data before the experiment and the analysis of the longitudinal comparison of the two types of results after the experiment.

In this paper, before the experiment, the comparative analysis and t-test of the study results of the experimental class and the control class are carried out. After half a semester of the experiment, the horizontal comparative analysis and t-test of the study results of the experimental class and the control class are carried out.

4. Discussion

4.1 Comparison of Pre and Post Test between Experimental Class and Control Class

The results show that the students of the two classes have the same level of mathematics, no significant difference and comparability. The next experimental study can be carried out. Through the flipped classroom teaching management mode, a semester teaching experiment was carried out.The group statistical results showed that the average scores of the experimental class after the test were 91.523, The average score of high number in the post test of the control class was 87.477, and the difference between the mean and the post test was 4.0455. It shows that the flipped classroom teaching management model can help improve students' academic performance, as shown in Figure 1.

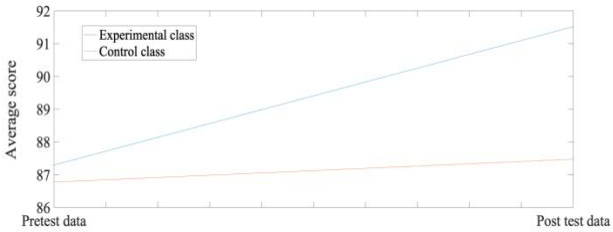

Figure 1. Comparison of mean values before and after test between experimental class and control class

4.2 Longitudinal Comparison and Analysis of Experimental Class Results

SPSS data analysis software was used to compare the test data before and after the experimental class. The results of group statistics showed that the average score of the experimental class before the experiment was 87.295 points, while the average score of the control class was 91.5227 points.

Table 1. Paired sample test of experimental class

Achievement	Paired difference			95% confidence interval of difference		t	df Sig (bilateral)	
	Mean value	Standard error	Standard error of mean	Lower limit	Upper limit			
Pre test - post test	-4.227	7.795	1.175	-6.597	-1.857	-3.597	43	0.001

The t-test results of paired samples show that: the high scores of the experimental class before and after the experiment are compared by t-test: $P = 0.001$, $P < 0.05$, so the difference of the high scores of the experimental class before and after the experiment in the flipped classroom teaching management mode is statistically significant, which shows that the high scores of the experimental class before and after the experiment in the flipped classroom teaching management mode are significantly different, The high scores of experimental class after the experiment were significantly higher than those before the experiment. It shows that the flipped classroom teaching management model is helpful to improve students' academic performance.

There was no significant difference in the scores of the control class before and after the experiment ($P > 0.05$). Therefore, it can be concluded that the flipped classroom teaching management mode in CAU is of great help to students' learning, and the flipped classroom teaching management mode in CAU is of great help to students' academic achievements.

Conclusions

Taking B University in city a as the practice research, through the teaching practice activities

under the flipped classroom teaching management mode in the experimental class, in order to provide the experimental data for the empirical analysis of the effectiveness of the flipped classroom teaching management mode. Spss19.0 software was used to analyze the experimental data and analyze the changes of students' academic performance before and after the experiment under the traditional teaching management mode and flipped classroom teaching management mode.

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