

The application of advanced mathematics flipped classroom in private undergraduate universities

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Abstract: The development of modern educational technology is not only the ladder of social progress, but also has a profound impact on the teaching of colleges and universities. A variety of online teaching modes emerge at the historic moment. Flipped classroom is the online and offline mixed teaching mode based on super star learning. In this paper, flipped classroom teaching in higher mathematics class of private undergraduate colleges is studied, teaching advantages are analyzed, teaching experience is summarized and information technology is integrated, which has reference significance for the development of teaching in colleges and universities.

1. Introduction

The emergence of flipped classroom overturns the teacher-oriented teaching mode in the traditional classroom. It plays the content that needs to be taught by teachers in the way of "short video", so that students can learn independently before class. Teachers can solve students' doubts in the learning process during class time, increase students' sense of learning participation, and students can expose their needs in class. To understand and master knowledge in the communication and discussion, and finally achieve the purpose of teaching. The private undergraduate higher mathematics course is not only the basic course of science and engineering major, but also the teaching tool to assist students' learning and cultivate students' rational thinking. The study of higher mathematics plays a decisive role for students. In the actual teaching process, because of the unique strict logic and strong consistency of higher mathematics, students in contact with higher mathematics at the beginning of the "alert" psychology, and the past higher mathematics teaching mode makes the classroom more boring and monotonous, unable to arouse the enthusiasm of students. Flipped classroom makes up for the shortage of students unable to find teachers for review in the traditional teaching mode in terms of teaching time, so that students can increase their learning time from fixed classroom to optional electronic equipment. The change of learning mode enhances students' desire to explore, and then increases their enthusiasm for learning. Therefore, it is of practical significance to explore how to carry out flipped classroom teaching mode in private undergraduate colleges^[1].

2. Analysis of the current situation of higher Mathematics teaching in private undergraduate colleges

2.1 Focus on the teaching of knowledge.

Students in private undergraduate colleges generally have weak basic knowledge, and there is a certain resistance to the learning of advanced mathematics. However, advanced mathematics itself has the problem of too much teaching content and too few class hours, so teachers tend to pursue progress while ignoring the content. The explanation of mathematics knowledge runs through the whole class, and students can only passively receive it without the opportunity to express their needs. Lack of communication between teachers and students, "teaching" and "learning" become two things of different progress, such a situation on the one hand will lead to students in the process of learning the sense of achievement and participation gradually lost, as time goes by the initiative to learn weakens^[2]. On the other hand, teachers cannot timely understand the learning dynamics of students, and cannot adjust the key and difficult points of teaching according to the reactions of students.

2.2 The teaching content and system remain unchanged

In the past, the teaching system of higher mathematics requires the teaching contents to be explained in all aspects and the pursuit of rigorous theories. However, this can no longer meet the requirements of The Times with the rapid development of knowledge and science and technology. In the teaching of higher mathematics, the teaching contradiction of fewer class hours but more content has been produced. Since the beginning of the 21st century, China has begun to vigorously promote the eighth teaching reform, which has made corresponding rectification of the course content setting and teaching requirements of each major. Due to the impact of the epidemic, offline classroom teaching is often reduced. When teachers teach the knowledge points of higher mathematics, the teaching key points and teaching difficulties cannot be explained in detail. It has a certain impact on the teaching quality and teaching effect. At the same time, the special secrecy and logic of higher mathematics are more restrictive to teachers. Students report that there are certain difficulties in learning higher mathematics, and they cannot fully understand the concept of higher mathematics at the beginning of learning, because of the short class time and the large and difficult contents. So that a small number of students have more or less negative emotions to the higher mathematics course.

2.3 Students have uneven foundation and vague learning objectives

There are two kinds of students in the university where the author works: college entrance examination and independent enrollment. Candidates who usually choose private colleges and universities are generally in the middle and lower reaches, with weak basic knowledge and not sensitive enough in understanding knowledge points. Especially, students who enter schools through independent enrollment have little knowledge reserve and go to school just for the sake of going to school, which means they lack understanding of their professional background and fear^[3]. In terms of learning objectives, students cannot understand the connection between higher mathematics and their major, and feel that "what they have learned" and "what they have used" do not match. The loss of learning objectives and the sharp decline in learning interest will cause students to appear various behaviors unrelated to learning in class.

3. Advantages of private undergraduate colleges implementing flipped classroom

3.1 Enrich learning resources and increase learning options

Ten years ago, 90% of advanced mathematics learning was completed through the teaching of teachers in class, and the learning time was completely fixed. Even though some students could use computers, they were neither familiar with nor convenient to find the teaching resources of mathematics. Only a small number of people who had used computers could simply use the network to learn under the guidance of teachers. Nowadays, the usage rate of smart phones and ipads basically reaches more than 90%, and the learning functions of the super Star learning platform are perfect and comprehensive. Flipped classroom is to push detailed teaching videos to students through the Internet. At the same time, excellent network learning resources, huge knowledge-carrying database and advanced learning methods can help students easily complete learning at any time^[4].

3.2 Improve learning time and increase learning freedom

Teachers send teaching resource to the learning channel, and the learning of advanced mathematics is no longer confined to 40 minutes of class and a narrow classroom. With the coverage of electronic devices and the network, the malleability of the classroom in terms of time and space increases. Learning can be done at home, on the subway, before going to bed, or after waking up. Teachers can also realize rapid communication with students through the Internet to help students locate the key points of knowledge and solve the confusion in learning.

3.3 Fully embody the student-centered teaching concept

Compared with the traditional classroom, the biggest advantage of flipped classroom is that it truly reflects the student-centered teaching concept. The application of flipped classroom makes preview no longer an empty talk. In the middle stage of class, teachers are targeted to solve the problems encountered by students in the process of learning. Result-oriented, teachers check and fill in the gaps in students' learning. The communication between teachers and students is enhanced in depth and breadth. After class, students, teachers and students can communicate with each other through online platforms. In the whole learning process, students can control the time, place, difficulty and breadth of learning by themselves. Flipped classroom is truly student-centered.

3.4 Grasp students' learning situation in real time

Learning master can complete pre-check-in, learning time statistics, random check, group discussion between classes, homework, online correction, independent summary, group testing, mid-term inspection and so on. Teachers can complete the supervision of students' learning according to the data feedback of learning master, grasp the learning data of students in real time and adjust the teaching plan.

4. Implementation methods of flipped classroom in private undergraduate colleges

4.1 Focus on pre -class learning

Determine teaching objectives; Mathematics teaching objectives refer to the expected learning tasks of teachers and students in the process of higher mathematics teaching]. It divides and designs knowledge based on the teaching objective, and also takes it as a blueprint to help students think and integrate what they have learned, and finally complete the internalization of knowledge. In the

flipped classroom model, the teaching objectives can be refined into two aspects: pre-class and classroom teaching objectives.

Pay attention to the use of teaching videos; Teaching video is a key step to complete flipped classroom teaching, effective teaching video can greatly improve students' interest in learning, at the same time, teaching video without time and space restrictions also improve teaching efficiency, teaching video can be recorded by itself or combined with online teaching resources, should pay attention to the needs of students when making teaching video, pay attention to the following points: (1) focus; (2) Easy for students to understand; (3) Put forward thinking; (4) targeted; (5) Control the duration and screen.

4.2 Exploration of classroom activity design

Classroom question design; Questions are a kind of preset situation, which can arouse students' interest and desire to explore. The design of questions in flipped classroom consists of two aspects. One is from the perspective of students, the questions that students encounter when reading textbooks, watching teaching videos given by teachers and completing targeted exercises before class in the independent learning stage. The other is from the perspective of the teacher, the teacher according to the requirements of the syllabus, according to the students based on the design of teaching objectives, teaching content, teaching difficult points and summarized problems. The teacher should sort out the problems encountered in these two aspects before class, sort out the key problems and individual cases, and design the problems in line with the classroom situation.

Group inquiry learning; Teachers can divide students into different groups according to their learning ability, thinking agility, personality and test scores. Each group can independently complete knowledge exploration, collaborative learning and group discussion. The teacher can also give appropriate guidance to students during this period to help them think rationally, grasp the key points and complete knowledge learning.

Communication of results; After the learning groups solve the difficulties encountered in learning through collaborative learning, they can communicate with each other and discuss their common problems with the guidance of the teacher.

Classroom teaching evaluation; Reflection and self-examination are an important part of growth. In flipped classroom, qualitative evaluation of teaching process, quantitative evaluation of teaching results, summative evaluation of group learning and formative evaluation of individual growth should be achieved. The evaluation results can become an important reference basis for teachers to understand students' learning situation, adjust teaching objectives and learning tasks timely, stimulate students' learning motivation, and finally form the teaching effect.

4.3 Make proper use of after-school links

Up to now, the flipped classroom teaching model has been promoted, and pre-class preview and class are the two links that people focus on. Reviewing the past and learning the new are the key to learning, and the after-class link is only an important part of flipped classroom. Psychological research shows that the forgetting curve of people's memory of things reaches its peak on the seventh day, and in this process, appropriate review. It can lengthen the forgetting curve by a month or more. Although the process of knowledge teaching and knowledge internalization concerned by people has been adjusted correspondingly after the implementation of flipped classroom, the after-school link is still crucial. It can be improved and innovated on the basis of the completely unified after-school homework in traditional teaching and combined with the unique teaching mode of flipped classroom, and reserved targeted homework while respecting the differences of students. For students with weak foundation, students can be asked to complete the frequency of watching

teaching videos; For students with strong ability, prepare more difficult questions such as postgraduate entrance exams to improve students' thinking development, teach students according to their aptitude, and develop comprehensively.

5. Conclusion

The application of flipped classroom teaching model improves the teaching model of "blackboard + chalk + teaching courseware" in the previous teaching. Based on students' limited learning time and space, it greatly improves students' learning environment. It improves learning efficiency, increases learning interest, enhances independent learning ability and the ability to summarize, exercises students' ability of expression, cooperation and communication, changes the role relationship between teachers and students, and makes students become the master of learning in the real sense. This also requires teachers not only to have the ability to impart knowledge, but also the ability to use modern educational technology, the ability to analyze data, teachers should focus on students' learning dynamics, design reasonable teaching activities, pay attention to students' teaching evaluation, adjust appropriate teaching strategies, etc. It can be said that the implementation of flipped classroom is a win-win model. In this process, it will also encounter different obstacles, such as the ten inferior horse driving, the work is not giving up. he breast gland. Once the cancer cells fall off, the free cancer cells can spread to other parts along with the blood cir

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