

## Research on the Mixed Learning Model of Higher Mathematics Based on Online and Offline Learning

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**Abstract:** With the rapid development of society and the continuous progress of economy and science and technology, people's life has naturally improved greatly, and the progress of science and technology has also been integrated into the social production and administration fields. In recent years, the development of computer information technology has been unprecedented, which has brought great changes to our education. People's learning methods and modes have changed greatly compared with the previous ones, and they have more choices and paths for knowledge acquisition. With the continuous intensification of social competition, learning has become one of the lifelong tasks of people. Colleges and universities are the theme of high-level education in China. Higher mathematics is also a public basic course of many professional disciplines. At present, there are more or less problems in teaching ideas, teaching modes and teaching methods in Higher Mathematics teaching, which lead to students' difficulty in learning and poor learning effect. In the regular learning of higher mathematics, students mainly listen to teachers' lectures in class and answer after-class exercises. With the help of online learning, students can spend better time in other areas learning. This paper mainly discusses the mixed learning mode of higher mathematics on-line and off-line, and provides relevant suggestions and references for the peers of higher mathematics education.

### 1. Introduction

With the rapid development of information technology, Internet technology has been widely used in all areas of society, and it has been integrated into all aspects of people's lives. People's learning, work and life have become inseparable from the Internet, and with the development and popularization of mobile smart terminals, It also creates better ways for people to learn knowledge. As the main body for training professional talents for society, institutions of higher learning must constantly adapt to the progress of society, improve and optimize the educational teaching model and teaching methods, so that students can better obtain knowledge and improve learning efficiency. In the current situation, learning is a compulsory course for many people. Not only can online students listen in the classroom at school, but after class, ordinary people can also watch the teacher's explanation with the help of mobile phones and Tablets. The learning path is more extensive, and the learning place and time are more unrestricted. This is the biggest difference between online and offline teaching. At present, many colleges in China have carried out various forms of online and offline course learning models. Through this model, students can prepare for the class before the class and propose to the teacher what they do not understand. The teachers in the class can explain the purpose and improve the efficiency of teaching and learning. At the same time, teachers can obtain more feedback after class, understand the existing problems in teaching, solve the difficult problems in learning, and improve learning efficiency. Higher mathematics is a public basic course required by most majors in colleges and universities. This course is characterized by strong Abstraction and required students to have strong logical thinking ability. Many learners are not confident, daunting, and the learning effect has not been very good. In order to solve these phenomena, the feasibility, advantages, and learning effects of the online and offline learning modes of higher mathematics are mainly discussed in this article. Reference only for

relevant colleagues.

## **2. Current Teaching Situation of Higher Mathematics in Universities**

With the development and transformation of society and the development of people's educational ideas, new requirements have been put forward for the current teaching of higher mathematics, as well as for mathematics professionals. There are still some differences between the talents trained in the teaching of Higher Mathematics in the past and those demanded by today's society. The talents trained in the old teaching mode can't fully meet the requirements of the new era. Nowadays, there are still many shortcomings in the teaching of Higher Mathematics in Colleges and universities, mainly as follows:

### **2.1. Improper grasp of teaching emphasis**

At present, there are many colleges, when teachers explain the knowledge in textbooks, because they are afraid of laborious, in order to save energy, they are less prepared for the real key and difficult knowledge, and the explanation is not clear enough, while they spend a lot of time explaining many simple knowledge, which leads to inappropriate grasp of the teaching focus, makes the students grasp the wrong key points. The students are not clear about where the key points are in the textbooks. At the same time, students' mastery of real key knowledge is not particularly solid. Therefore, it will affect students' follow-up learning. Students are not good at grasping the basic knowledge which is difficult to grasp. Naturally, students are not proficient in mastering the knowledge as a whole, and can't be integrated, which will naturally affect the students' learning situation. Many knowledge in high mathematics is very basic. Students must master these knowledge skillfully, so that they can truly learn to connect, better grasp the knowledge of various parts, and better study. Therefore, in the process of teaching, teachers should not choose knowledge points which are too basic to reflect the connotation of knowledge and need a lot of time to explain in order to relieve the pressure of teaching or help students to relieve the pressure of learning. Make sure that students understand what they are teaching.

### **2.2. The teaching method is too old-fashioned.**

In today's society, computer technology and Internet technology are constantly developing. The school's teaching methods should have progressed with the times. However, many schools are still old teaching methods, such as blindly reading books. Some teachers also use PPT to teach. However, it is only a quick reading of the PPT, and there is no interaction between teachers and students. The old teaching method is not conducive to the development of the teaching process, making the school's teaching curriculum slow, learning efficiency is low, and the actual listening effect is not good, which is not conducive to students' learning. Many school teachers have not yet adapted to the teaching model of the Internet. It is still a traditional teaching model. Although the traditional teaching model has its own characteristics, it also has its own unique advantages. However, with the development of the times, the old teaching methods have already had a lot of new teaching environment. Today's teaching should be based on new media and new scientific and technological means to make teaching more comprehensive and rich. It enables students to better master knowledge, truly improve their abilities, and cultivate talents that are more suitable for the needs of today's times.

### **2.3. The function of new technology is neglected in the process of teaching.**

The application of science and technology in various fields of society has also brought different changes to education. Nowadays, many teaching methods have been born with the help of Internet technology and computer technology. The birth of these methods has helped to make great changes in teaching. When teaching does not attach importance to the introduction of new content, the old content is often bored by students. After a long time, students become bored with the classroom, which will naturally affect students' learning. Therefore, school teaching should attach importance to new technology, better integrate new technology into learning, help students better improve their

interest in learning, so that students can learn better. Therefore, schools should pay more attention to the use of new technical means to help students better stimulate interest in learning, help students better progress, better learning.

#### **2.4. Defects of teaching content and assessment mechanism are obvious.**

In higher mathematics learning, there are many basic knowledge is very important, these basic knowledge is the key of the follow-up learning. However, these knowledge have not been well understood and mastered by students, so it is necessary to explain these knowledge. More patient and meticulous can effectively help students to learn, to master these knowledge. So that students can really grasp these knowledge, so that they can learn better in the future.

However, it does not take much time to describe the essential basics in many of today's teachings. For these key knowledge, the student only has a simple understanding, then the teacher enters the next chapter, the student grasps the knowledge to be naturally weak. At the same time, when examining, the proportion of the usual scores is very large, and there are fewer tests for the knowledge needed in the real future, and the quality of the assessment content is not high.

### **3. Research of on-line and Off-line Mixed Learning Model and Method**

#### **3.1. Feasibility of Mixed Learning**

Higher mathematics is a very logical and reasoning course. When studying, students need to invest a lot of energy, and spend a lot of time after class to study, think, and practice. After a lot of practice, To truly understand and master knowledge. If the students only study in the classroom as usual and ignore the after-school revision and practice, the homework is only copied by the classmates, then the teacher can not grasp the real situation of the students' learning in time and adjust the teaching. At the same time, University teaching is different from middle school teaching, teachers usually seldom communicate with students, and the time spent in class is relatively short. Students sometimes focus their attention on a certain knowledge point in the classroom. This will delay the study of other knowledge points, and students have fewer opportunities to consult their teachers after class., which will greatly affect the students' learning situation. In addition, higher mathematics requires students to have strong logical reasoning and understanding ability. Theory is also varied. Even if some students spend a lot of energy to study after class, they still can't use the relevant knowledge flexibly and understand the essence of it. In order to solve the above problems, we need to explore and optimize the learning mode and methods. Through the innovative teaching mode, we can help the students better prepare and review, understand the knowledge they do not understand, and find some mechanisms to improve students' study time in order to improve learning efficiency and help students better progress.

In traditional teaching and learning, the main thing is that teachers explain knowledge in class and assign homework to students. Then students need to finish homework after class. At the same time, they need to understand their confused knowledge points after class through the communication between students. But this way of learning has its own shortcomings in University learning. Because in the University curriculum, the class time is less, which means that many difficult knowledge, teachers do not have much time in the classroom to explain these very difficult knowledge, So it is very difficult for students to understand these knowledge by themselves.

The rapid development of 4G communication technology and intelligent terminals provides a carrier for online learning. It also provides an important opportunity for the development of higher education. For students, mobile phone is undoubtedly a very good mobile carrier for learning. It can help students learn better through the network, but also create conditions for teachers to disseminate knowledge. Teachers can record video lessons, key and difficult points and other important knowledge into videos, and play them in the classroom on the network, which can help students learn better. Similarly, teachers can arrange homework in time on the network, and students can take online tests. And in this way, students can solve their own problems in time. In normal learning, as long as they encounter problems they don't understand and problems they can't do, through online

learning and inquiry, they can help students improve their learning efficiency better. In fact, online learning is also a good opportunity to help students learn better in their own free time and improve their actual learning effect when they have no courses. By publishing online videos, teachers can save part of their time, thus saving teaching time and improving the quality of teaching.

### 3.2. Discussion on the Implementation Method of the Mixed Learning Model of Higher Mathematics Online and Off-line

To better integrate online and offline learning, it is not only teachers and students who need to have such ideas. At the same time, school administrators need to actively support policies and introduce policies that encourage teachers and students. For example, Teachers build a perfect learning platform for online and offline mixed learning. The school gives teachers a certain amount of economic and spiritual rewards. This can greatly enhance the enthusiasm of teachers. Another example is that students can study on the platform for a certain period of time, and the student's grade point can increase the corresponding score, so that the atmosphere of online learning can be fully promoted, which can also lead students to better learning and progress.

Establish an online learning platform. The development of science and technology has made online teaching and learning more concise and convenient. In order to learn better, an excellent online learning platform is necessary. By publishing learning videos on the platform, students can discuss on the online platform, express their views in the platform, communicate with each other in the platform, help everyone progress together, and truly master the knowledge they have learned.

Setup offline learning group. Students can not only learn online, but also need offline learning. In offline learning, students can better communicate. If only online learning, there will be some students who do not study seriously. Through off-line group, they can help students to better improve themselves, through mutual supervision between students, help students to better improve themselves and improve learning efficiency.

Establish and improve the detailed assessment system, the purpose of mixed learning is to help students better improve themselves, in order to test the results of learning, it is necessary to assess. Through the establishment and improvement of assessment system, students'academic performance in each period is tested to help students understand their own learning situation, but also enable teachers to understand the learning situation of students, in order to better teach and help students learn better.

## 4. Learning effect of online and offline teaching mode

By investigating dozens of brothers'colleges of Higher Vocational and undergraduate education, some of these schools offer online and offline teaching, while others adopt traditional classroom teaching. By counting the academic achievements of more than 2000 students, the scores between 80 and 90 are good, and the scores above 90 are excellent. The comparative data in Figure 1 are obtained.

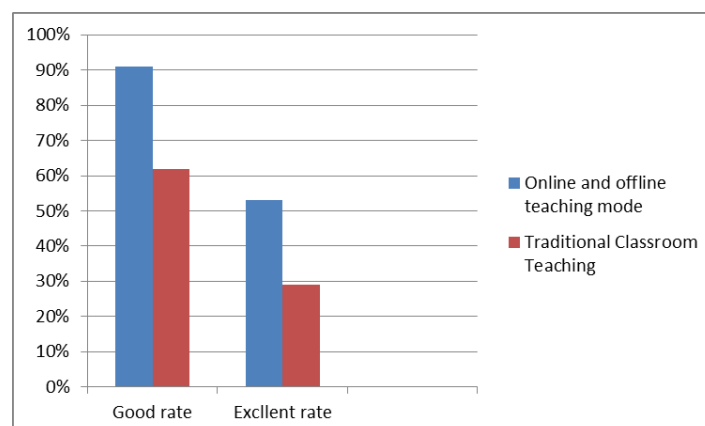


Fig 1. Comparison of learning effects between online and offline teaching and traditional teaching

## 5. Conclusion

The progress of information technology has a great impact on today's education industry. The change and development of teaching modes and methods have promoted the continuous improvement of higher education. At present, there are still many problems in the teaching of Higher Mathematics in our country, which lead to the poor learning effect of students. In order to help students achieve better results, this paper from the current situation of higher mathematics education, as well as online and offline learning modes. Through the analysis of this paper, the author believes that teachers in Institutions of higher learning can make students learn easily, happily and effectively by means of online and offline mixed teaching methods. At the same time, school managers should actively support students from the policy, so that higher mathematics can no longer become a barrier to students' learning.

## References

- [1] HUA Hong-bo. Teaching Mode of Higher Mathematics Course for Foreign Students Based on "Online + Online"[J]. Journal of Huaiyin Teachers College (Natural Science Edition), 2018, 17(3):270-271,275.
- [2] XIA Yu. An Improved Method of Internet+ Classroom Teaching[J]. China Educational Technology & Equipment, 2017, (22):66-67,72.
- [3] JIANG Ying-chun. Exploration and Practice of Autonomous Learning Teaching Model in Higher Mathematics in the Age of "Internet +"[J]. University Education, 2018, (09):92-94.
- [4] PAN Jie, XU Feng. Research on Higher Mathematics Teaching Based on Network Teaching Platform[J]. Education and Teaching Forum, 2015, (40):178-179