Research on the Application of Computer in the Construction of Higher Mathematics Network Teaching Mode Platform

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Abstract. With the continuous development of computer technology, digital technology continues to affect the teaching mode. For colleges and universities, advanced mathematics is almost a compulsory course for college students. This article relies on computer technology, aims at the construction of advanced mathematics network teaching mode platform, analyzes the feasibility of mixed teaching mode, explores the "micro-learning + advanced mathematics" mode, and is task-driven Use situational teaching as a means to improve the quality of higher mathematics teaching.

Keywords: Micro-learning, Advanced Mathematics, Computer

1. Introduction
Microlearning is a new type of learning model based on the mobile network and using micro-media and micro-learning resources[1-3]. It has the characteristics of fragmentation, autonomy, individualization, and ubiquity, which is beneficial to satisfying students Individualized learning needs are an efficient, autonomous, and convenient way of knowledge transmission and learning mode, which is a useful supplement to traditional classroom teaching[4-6].

Relying on computer technology, this article analyzes the feasibility of the hybrid teaching model based on the construction of the advanced mathematics network teaching model platform, explores the "micro-learning + advanced mathematics" model, and provides support for reforming the traditional teaching model.

2. Research on computer-based hybrid teaching mode of advanced mathematics
The advanced mathematics hybrid teaching model based on micro-learning is that teachers make the main teaching information resources into micro-class micro-videos, etc., and present them to students through the hybrid teaching platform. Students use mobile devices to conduct autonomous micro-learning, and exchange and discuss in the classroom. Teaching summary, teachers and students interact through the course WeChat group during the whole teaching process. The teaching practice process adopts the flipped classroom which is reverse to the traditional classroom for teaching. Advanced mathematics courses are highly abstract and rigorous. Many concepts or theories involved in the content are even more obscure, such as the concept of limit and the median theorem. Even in the early days of enrollment, many freshmen have a "learning" "Useless" idea. If you do not conduct
targeted previews and blindly listen to lessons in advanced mathematics classes, it is difficult to quickly grasp the connotations of many concepts and theorems. Therefore, the advanced mathematics curriculum requires students not only to preview the knowledge in the textbook, but also to understand the important concepts and the inner meaning of the important theorems in combination with actual background materials.

2.1. Blended learning
Blending learning is a kind of hybrid in a broad sense. It can be seen as a mixture of traditional classroom teaching and online learning, it can also represent a mixture of different learning theories, and it can also be seen as a mixture of learning resources and learning tools.

2.2. The connotation and characteristics of the advanced mathematics blended teaching model based on micro-learning
The hybrid teaching mode of advanced mathematics based on micro-learning refers to the background of the era of "Internet + education", based on learning theories such as constructivism, humanism, and connectivity, based on the digital reform of advanced mathematics teaching, and using new technological methods in the information age, Through a variety of teaching methods and means such as task-based teaching, inquiry learning, etc., in accordance with the "flipped classroom" teaching mode system, implement the overlapping mobile, open, and interactive teaching mode. Taking the "flipped classroom" teaching process as the main line, combining the advantages of traditional classroom teaching, designing a teaching process that is different from the traditional classroom, that is, the teacher assigns teaching tasks (including knowledge transfer, problem-solving skills and practice tests) Divide into several micro-tasks to make micro-class videos and upload them to the network platform. Students use smart mobile terminals for mobile and fragmented autonomous micro-learning before or after class to complete learning tasks. Class time is fully used for cooperation and communication, Discussion and summary, etc., so as to realize the transformation of teaching mode such as the transformation of teacher and student roles, the humanized organization and management of teaching activities, and the reform of teaching evaluation methods.

2.3. The goal and significance of the advanced mathematics blended teaching model based on micro-learning
This is based on "Internet +", using various "micro" technologies and "micro" achievements in the "micro era" as a means, using "flipped classroom" as a way, and using the advantages of traditional classroom teaching to reverse the order of traditional classroom teaching. The reform of the hybrid teaching model of the teaching process aims to continue to explore the depth and breadth of the integration of information technology and advanced mathematics teaching in the era of big data, according to the training objectives of advanced mathematics teaching, combined with the actual ability of students, to carry out advanced mathematics teaching model innovation. In addition, its ultimate goal is to study the construction of an open teaching resource environment, realize the sharing of high-quality teaching resources, and turn the boring, solidified and passive traditional learning method into a more random, flexible, and active "micro-era" mobile learning method, prompting The classroom efficiency is maximized, so as to form a highly informatized, efficient, independent and convenient way of knowledge transmission, learning, digital information management, and communication and dissemination. At the same time, it is also the network, digital, mobile, multi-level, Multi-angle, all-round learning provides reference.

3. Construction of a platform for advanced mathematics network teaching mode based on micro-learning

3.1. Constructivist learning theory
Constructivist learning theory believes that learning context is the effective growth point and retrieval
clues of knowledge, and emphasizes that learners should select, process and process learning content based on their own knowledge and experience, through the interaction of "situation" and "collaborative learning". Gain knowledge by constructing its own unique meaning. Therefore, the construction of the hybrid micro-learning teaching model is to create various learning situations and make micro-class micro-videos. Students use the hybrid teaching platform to conduct self-preparation before class, active review after class, and online or classroom interaction to achieve new knowledge accumulation.

3.2. Humanistic learning theory
The theory of humanistic learning is based on humanistic psychology and applied to teaching research and experiments. It reveals that the essence of learning is the construction of a unique meaning for people to realize themselves, attaches importance to students' self-learning and self-realization, and advocates emotional factors. An important role in student learning. The teaching model studied in this article is to communicate and discuss through a mixed teaching platform, construct student-centered situational teaching, strengthen its emotional experience, and create a harmonious environment and harmonious teaching interpersonal relationship for students' personalized advanced mathematics learning. Stimulate the inner potential of students to learn, thereby satisfying the desire of "self-realization".

3.3. Teaching mode design
In the specific implementation process, the premise is to upload learning resources and release learning tasks, based on the network monitoring and data analysis of students' learning situation, with classroom communication and summary as the core, and after-class WeChat group feedback interaction as the key to form "Online" and "offline" integrated teaching mode. The "offline" part is mainly reflected in classroom teaching. The teaching method of "blackboard + PPT" is changed. Students use mobile phones, network platforms and other resources for self-learning micro-courseware and other resources. Teachers guide students to complete the summary and grasp of knowledge points, and organize students to do Discussions and other activities have changed the boring scope of blackboard teaching, the rapid progress of multimedia teaching, and the difficulty for students to master. The "online" part is the online learning status of students. The platform automatically records the online learning status of students and generates online learning results. At the same time, in terms of homework and test questions, a question bank is established according to the knowledge points, and the system randomly generates homework and test questions, and students can practice at any time. In addition, a course WeChat group is established, teachers and students communicate through WeChat and teaching platforms, and teachers can provide timely guidance to students.

In the actual teaching process, different tasks are carried out in three stages before class, during class, and after class. Each stage has its own focus, as shown in Figure 1.
3.4. Teaching mode practice and analysis

In order to verify the effectiveness of the new teaching model in higher mathematics teaching, the research team selected two classes of Economic Management: Computerized Accounting to conduct a controlled experiment, each with 50 students, and implemented a one-semester teaching practice. The experimental class adopts a micro-learning-based advanced mathematics mixed teaching mode to cultivate students' habit and ability of autonomous mobile micro-learning, while the control class adopts conventional teaching. Analyze the final exam scores of the two classes and test the differences in student academic performance under the two models.

Table 1. "Advanced Mathematics" final grade statistics description.

| Class       | Teaching mode               | Mean  | Standard deviation | Sample size |
|-------------|------------------------------|-------|--------------------|-------------|
| Experimental class | Blended teaching             | 86.70 | $S_x = 8.972$       | $m = 50$    |
| Control class     | Regular teaching             | 80.78 | $S_y = 10.554$      | $n = 50$    |

From the data in Table 1, it can be seen that the average scores of students under the mixed teaching mode are much higher than those under the conventional teaching mode. In terms of standard deviation, the internal dispersion of the former is relatively small, while the two-level differentiation of students' performance in conventional teaching is more serious than that of the mixed teaching model. It can be considered that the teaching effect of the new model is significant.

The following analyzes whether different teaching modes have significant differences in student performance. Suppose the student's score in the experimental class is $X \sim N\left(\mu_1, \sigma_1^2\right)$, and the student's score in the control class is $Y \sim N\left(\mu_2, \sigma_2^2\right)$. Consider hypothesis testing $H_0: \mu_1 \leq \mu_2$, $H_1: \mu_1 > \mu_2$.

The test statistics are shown in formula (1):

$$u = \frac{x - y}{\sqrt{\frac{S_1^2}{m} + \frac{S_2^2}{n}}}$$

(1)
The calculated result $u$ is 2.89, the rejection domain of this hypothesis test is $W = \{ u > u_{\alpha} \}$, and the significance level is $1-\alpha = 0.95$, $u_{0.95} = 1.645$.

Therefore, $u = 2.88 > 1.645$, so the null hypothesis $H_0$ is rejected. Therefore, it can be considered that the mixed teaching mode of higher mathematics based on micro-learning can significantly improve students' performance.

It is inferred from this that in specific teaching practice, the new teaching model has a certain role in promoting students' higher mathematics learning.

3.5. Teaching effect

In the specific teaching practice, the mixed teaching mode of higher mathematics has a significant effect. This semester classmates of the experimental class visited resources such as micro-courseware for 1,546 times, with a duration of 20,539 minutes, 26 questions, 15 online discussions, and 43 five-star reviews for classroom teaching. According to the online and offline teacher-student or student-student interaction and the comparative analysis of student participation and traditional classroom teaching, the new teaching model is more conducive to promoting two-way communication between teachers and students, stimulating the enthusiasm of students for mutual assistance, and better collaborative learning. Sexual learning in turn promotes the creation of a positive peer relationship between students, and this peer relationship has a positive impact on learning. From the perspective of system time and target positioning, learning time and learning location are both random and autonomous. The fragmentation of learning content helps students quickly complete the process of knowledge transfer and internalization, and stimulate their internal motivation for learning. A virtuous circle is formed between learning interest and learning ability, which produces the Matthew effect. Yu Qiang with learning ability, the better the learning effect. From the analysis of learning needs, the results show that students have requirements for advanced mathematics knowledge and application skills, which vary from person to person. Those with poor foundations focus on theoretical foundation learning and calculations, and those with better foundations focus on theoretical proofs and practical applications. In order to get a perfect score in homework, many students practice homework repeatedly, which enhances students' initiative personality. In short, the mixed teaching mode of higher mathematics fully respects the individual differences of students, implements diversified teaching, and can meet the multi-level learning needs of students.

4. Conclusion

Relying on computer technology, this article analyzes the feasibility of a hybrid teaching model based on the construction of a higher mathematics network teaching model platform, explores the "micro-learning + advanced mathematics" model, and uses task-driven and situational teaching as a means. This model can achieve classroom dimensions. Extension, breadth expansion, highlighting "student-centered", reflecting the active promotion of higher mathematics learning by the characteristics of autonomy, individualization, and ubiquity of teaching.

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