Research on the innovation of hybrid teaching mode of Higher Vocational Mathematics in the smart classroom environment

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Abstract: in the smart classroom environment, how to use the mobile Internet, big data technology, cloud computing technology and intelligent teaching terminal to build a personalized and intelligent teaching environment and improve the quality of mixed mathematics teaching has become an important issue for teachers to optimize the mathematics teaching mode in higher vocational colleges. Based on the smart classroom teaching environment, this paper expounds the application advantages of Higher Vocational Mathematics blended teaching mode, and discusses the teaching innovation and implementation measures combined with the current situation of higher vocational mathematics teaching.

Key words: smart classroom environment; Higher vocational mathematics; Mixed teaching mode

Introduction

Compared with the traditional multimedia classroom, the smart classroom has significant interactive and intelligent characteristics, supports students' access to ubiquitous resources, and the interaction between teachers and students is developing in a diversified and three-dimensional direction. At present, many teachers adhere to the people-oriented concept, use modern information technology platforms and resources, create a smart teaching environment, record and track students' learning behavior, design teaching content and enhance teaching pertinence. In the smart classroom environment, teachers can "break away" from the shackles of traditional classroom teaching, organically combine online platform teaching and offline classroom teaching mode, mix teachers' teaching with students' learning, optimize the follow-up teaching plan and adjust the teaching difficulty based on students' real-time learning records and learning feedback, so as to achieve the teaching goal of online assistance and intensive classroom teaching. However, in some higher vocational colleges, some teachers seldom use the mixed teaching mode, which is difficult to reasonably connect the online and offline teaching content, so they can not play the value of mixed teaching and improve students' learning level.

1. Application advantages of hybrid teaching mode of Higher Vocational Mathematics in the smart classroom environment

1.1 Improving students' autonomous learning efficiency

After entering higher vocational colleges, the new learning environment requires students to have strong autonomous learning ability and self-control ability, reasonably plan their learning time, and achieve the learning objectives of major or basic disciplines. In the traditional teaching environment, teachers play more of the role of "microphone" to impart the mathematical knowledge in textbooks to students. However, students only need to accept the content according to the instructions, so they lose the initiative of learning, and it is more difficult to stimulate the potential of mathematics self-study. Through the implementation of hybrid teaching mode, teachers can consciously change their teaching role, set students' autonomous learning and self-management goals with the help of intelligent terminals and network environment, provide scientific guidance for students' self-study, and urge students to prepare independently before class, solve problems in class, and digest knowledge outside class. Under the guidance of smart classroom environment and teachers, students can develop the habit of self-study before class, problem solving in class and consolidation after class, and continuously improve the efficiency of autonomous learning.

1.2 Meet the learning needs of multi-level students

There are natural differences in students' learning thinking, learning methods and learning, which requires teachers to design multi-level and diversified teaching objectives according to different students' learning basis and learning progress. In the traditional teaching environment, teachers' mathematics teaching hours are limited, and the teaching environment is also limited in the classroom, so it is difficult to set personalized teaching goals. Through the implementation of hybrid teaching mode, teachers can broaden mathematics teaching space, extend teaching time, investigate and count students' learning level by using big data technology, divide students' learning levels, set diversified learning goals, and meet the learning needs of multi-level students. At the same time, based on the student feedback of the smart platform, teachers can constantly try new teaching methods, such as group discussion method, problem teaching method and situational teaching method, to reduce the difficulty of understanding abstract knowledge and activate the online and offline teaching atmosphere.

1.3 Enhancing the timeliness of mathematics teaching evaluation

Teaching evaluation directly reflects students' knowledge level and teachers' classroom teaching effect. The timeliness of teaching evaluation determines the scientificity of teachers' teaching design. In the traditional teaching environment, the evaluation results that some teachers can refer to often come from the mid-term and final examination results. It is difficult for the assessment of the two stages to feed back the true learning level of students. In addition, the evaluation time interval is long, which is difficult to provide help for teachers to adjust the teaching design. By implementing the hybrid teaching mode, teachers can pool the power of information technology

and intelligent teaching terminals, release small test questions and quizzes at any time, online detect students' learning situation, timely collect students' feedback, investigate the effect of mathematics teaching, and understand students' learning level at all stages. At the same time, based on the smart classroom platform, teachers can understand the online, offline and after-school student data, enhance the comprehensiveness and timeliness of mathematics teaching evaluation, and provide reference for the adjustment of teaching content and teaching methods.

2. Current situation of mathematics teaching in Higher Vocational Colleges

Compared with undergraduate students, higher vocational students' mathematical understanding ability and learning ability are uneven, which is difficult to achieve good learning effect. Higher vocational mathematics knowledge is highly professional and abstract. It is difficult for students to fully understand and master knowledge only by listening to and reading textbooks. At the same time, in higher vocational colleges, some teachers use the large class teaching mode, facing a large number of students, and even have to teach hundreds of students at the same time. In teaching, they devote more energy to maintaining discipline and normal teaching, which is difficult to answer the doubts of each student. When encountering a large number of abstract mathematics knowledge points, although the students will preview in advance and seek the help of classmates, it is difficult to find the law of mathematics learning, and they can not get one-to-one help from teachers in class. In the long run, students' enthusiasm for learning will inevitably decline, and they cannot actively participate in classroom activities.

3. Innovative strategies of hybrid teaching mode of mathematics in Higher Vocational Colleges under the environment of smart classroom

3.1 Investigate mathematics learning and optimize online and offline processes

In the smart classroom environment, teachers should be good at using the smart platform and educational technology. Through the smart platform, teachers should issue mathematical questionnaires, systematically analyze students' data feedback, objectively understand students' cognitive level and basic level of mathematics, optimize the online teaching process according to students' learning situation, and reasonably develop and utilize hybrid teaching resources. Based on smart teaching platforms such as learning link and Tencent classroom, teachers can obtain high-quality mathematics resources and case resources, guide students to download online learning resources and participate in online self-study activities. Specifically, teachers can set online learning goals and classroom teaching goals according to the situation of students, make online teaching plans in advance, and let students log in to the platform to complete preview and self-test activities. For example, when explaining the "basic formula of calculus", teachers can push high-quality learning resources to students. They can also let students use the network engine to search the application principle, application content and application scope of calculus formula, and arrange several moderately difficult questions to let students master the application principle of formula in practice. Next, teachers can use the system data collection and automatic correction functions to understand the knowledge points with high error rate through screening items, observe students' mastery of different calculus formulas, and adjust the subsequent classroom content to focus on solving the problems that students are not familiar with. In addition, teachers can also use the preview reminding function of the platform to urge students to complete the preview task within a limited time, change students' lazy learning attitude and cultivate their autonomous learning habits.

3.2 Enrich offline practice activities by using network technology

Based on the online data and feedback of the smart platform, teachers can fully control the students' self-study level, design multi-level teaching activities according to the learning level of students, and use various visual network technology to help students clarify the key and difficult points of learning. In offline mathematics teaching, teachers can first combine online learning tasks, present chapter learning "brain map", lead students to clarify knowledge points and learning ideas in accordance with thinking logic, and encourage students to adjust classroom learning plans and grasp learning priorities according to the preview progress before class. At the same time, higher vocational mathematics has a strong practicality. For some knowledge that is difficult for students to understand in depth, teachers can use intelligent teaching software to carry out mathematical practice activities, so that students can learn abstract mathematical principles and break through the difficulties of mathematics learning and understanding by completing mathematical experiments. Specifically, teachers can present the use methods and precautions of MATLAB and Mathematica software, guide students to convert abstract knowledge or mathematical problems that are difficult to understand into graphics by using group inquiry method and problem teaching method, and use geometric graphics to express algebraic expressions to help them understand the concepts of definite integral and limit. At the same time, teachers can combine the teaching content, introduce some life problems, organize mathematical practice competitions, let students use mathematical knowledge and mathematical models to solve life problems, exercise their mathematical application ability, and stimulate students' enthusiasm for mathematical practice. Finally, teachers can let students combine the content learned in class, use visualization tools, draw their own mathematics learning map, mark the difficult points solved in class on the map, and use special symbols to mark the knowledge that they have mastered, basically mastered and basically understood, so as to provide visual data for extracurricular review.

3.3 Strengthen extracurricular teaching guidance based on smart teaching platform

After class, teachers should rely on the intelligent teaching platform, combined with pre class preview feedback and classroom teaching situation, and make some targeted review videos of key and difficult points, so that students can download videos according to the deficiencies of knowledge mastering according to the knowledge master map, and improve the knowledge structure by watching remedial knowledge repeatedly. After browsing the review materials of key and difficult points, students can clearly grasp the learning direction, share

the latest review experience and incomprehension on the platform, or record their learning thoughts into small videos and publish them on the platform to express their expectations for future learning resources to teachers, so that teachers can carry out personalized guidance. Taking the “basic formula of calculus” as an example, teachers can combine the calculus formula that students are not familiar with to make a special micro video. The duration of the small video is limited to 8 minutes. It mainly introduces the application principle, principle and scope, supports students to watch it repeatedly, and helps them consolidate the foundation of mathematics learning. After browsing the micro videos, students can use the smart platform to remotely connect or interact with teachers. By sending messages and videos, students can introduce the difficulties encountered in learning and ask for teachers’ help. According to the students’ information and feedback, teachers can further understand the students’ mastery of knowledge, and provide face-to-face video guidance by using the online platform when there are few students with similar problems; In the case of many similar problems, teachers can put the knowledge points into the scope of concentrated explanation in the next class and use the time in class to solve the problems. In order to urge students’ extracurricular learning and review, teachers can combine students’ pre class preparation and classroom performance, divide learning groups at three levels of ABC, and use the smart teaching platform to automatically issue online test questions with different difficulties and types, test the review of students at different levels, and strengthen extracurricular guidance.

3.4 Give full play to the advantages of smart assessment and strengthen teaching assessment in the whole process

Teachers should build a diversified, scientific and rational assessment system based on the smart teaching classroom and the characteristics of higher vocational mathematics teaching, and use the smart platform to evaluate students’ online and offline learning performance, covering the whole process of students’ mathematics learning and practice. First, set the online final exam. Based on the differences between the focus of higher vocational mathematics teaching and students’ learning, teachers can establish a mathematics question bank for multi-level students, allowing students to log in to the platform and accept the test questions randomly assigned by the system. It should be noted that in the allocation of system topics, teachers can combine students’ professional characteristics and learning levels to ensure that the topics are related to teaching materials and professional learning, and better test students’ mathematical knowledge and mathematical practice ability. Secondly, set up daily online assessment. Based on the hybrid teaching process, teachers can set test indicators that run through online teaching activities, include students’ online preview and preview answer scores into the assessment criteria, count the data of students who complete their homework on time every month, find out the students who can’t complete their homework on time, help the students with learning difficulties solve the problem of learning methods, and cultivate them to ask questions, seek advice in timeThe habit of reviewing in time. In addition, set up extracurricular performance indicators. In mathematics learning, some students’ learning and understanding ability is limited, but they have strong concentration in classroom learning, good learning enthusiasm and correct learning attitude. In order to objectively evaluate students, teachers should include classroom learning and extracurricular review in the scope of assessment, record students’ learning behavior in class and extracurricular teaching information, evaluate students’ mathematics learning attitude, and give reasonable mathematics evaluation.

4. Concluding remarks

To sum up, based on the smart classroom environment, innovating and implementing the hybrid teaching mode of mathematics in higher vocational colleges is related to students’ autonomous learning ability, classroom learning level and extracurricular review effect. Therefore, teachers should combine the mathematics learning situation of higher vocational students, optimize online and offline processes, enrich offline practice activities, strengthen extracurricular teaching guidance, and strengthen teaching assessment in the whole process, build a bridge between front-line learning in class, offline practice in class, and extracurricular online counseling, reform higher vocational mathematics teaching mode, and guide students to change their mathematics learning habits and strategies, Stimulate their interest in active learning, improve their autonomous learning efficiency and the ability to apply mathematical knowledge.

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