Exploration on the Teaching reform Path of Mathematics Courses in colleges and universities from the perspective of Education Informatization

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Abstract: The advent of the information age not only has a great impact on production and life style, but also has an impact on the education industry. Especially college mathematics courses, occupy a very important position in colleges and universities, the information technology skillfully into them, help to improve the teaching efficiency. This paper discusses the factors affecting the reform of mathematics courses in colleges and universities, analyzes the current teaching situation, and puts forward targeted reform strategies to provide a new direction for its development.

Key words: Educational informationization; College mathematics course; Teaching reform

Introduction:

With the rapid development of economy, the degree of informatization of society is gradually deepening, and the shortage of informatization in mathematics teaching activities in colleges and universities is gradually prominent. The traditional teaching method still occupies an important position. In order to meet the needs of the information age, college mathematics teaching activities need to pay attention to the integration of information elements, implement teaching reform, and promote the smooth development of college teaching activities.

I. Factors affecting the reform of informatization teaching of mathematics courses in colleges and universities

In the current stage of college mathematics course teaching reform, informatization has gradually become the mainstream trend. Skillfully integrating information technology into mathematics class can not only enrich teaching resources, help students solve math problems, but also significantly improve the quality of classroom teaching. However, in the actual teaching activities, there are some outstanding problems, such as the low application efficiency of information equipment, traditional education ideas and so on.

First, the tradition of educational concept. The educational ideas of mathematics courses in colleges and universities need to be changed to adapt to the development of The Times. Although many teachers have strengthened the application of information technology, there are still some teachers affected by traditional teaching concepts, only through information technology to show the teaching content, adopt traditional indoctrination methods, set learning tasks for students, and complete the teaching objectives. This kind of teaching method fails to give full play to the role of information technology, and also restricts the improvement of students' awareness and ability of information application, which has a certain negative impact on future learning activities.

Second, the students' actual situation. In the teaching of mathematics courses in colleges and universities, students are still in a passive learning state, relying on teachers to a high degree, unable to take the initiative to participate in the learning of knowledge, lack of enthusiasm for exploring mathematical knowledge. Therefore, in the actual teaching activities, teachers need to pay attention to the application of information technology, optimize teaching activities, make the teaching process more interesting, and improve the enthusiasm of students to participate in the class.

II.The teaching status of mathematics courses in colleges and universities from the perspective of education informatization

In the teaching of mathematics courses in colleges and universities, traditional teaching concepts still occupy a dominant position, and the teaching methods are relatively fixed in teaching activities, and still mainly rely on blackboard teaching, which does not keep up with the pace of development of The Times. At the same time, some colleges and universities obviously do not pay enough attention to information-based teaching, and the information literacy of teachers needs to be improved, which makes the implementation of information-based teaching in college mathematics courses face many difficulties. In addition, in the composition of mathematics teachers in colleges and universities, old teachers account for a large proportion, poor ability to adapt to information technology, it is difficult to master rich information technology, so in the development of relevant teaching activities, often encounter great difficulties.

III. The teaching reform strategy of mathematics courses in colleges and universities from the perspective of education informatization

1. Change the teaching concept

From the perspective of information-based teaching, teachers need to pay attention to the change of teaching concepts, respect the principal position of students in teaching activities, and help students learn with the help of information technology, so as to better highlight their value. For example, when teaching related contents of quadratic forms, teachers can first assign students to independently learn the nature and classification of quadratic forms. Secondly, through the network platform, teachers can push relevant materials about quadratic forms to students, including the introduction of academician Ke Zhao, "pioneer of quadratic research" and Ke's theorem, to guide students to correctly understand scientific research and establish the confidence of perseverance and inevitable success. In this process, teachers can use information technology to visualize abstract quadratic forms, positive definite quadratic forms and quadric surfaces, and use three-dimensional models to help students intuitively understand them. Finally, according to the actual situation of students, teachers can formulate targeted self-learning tasks and encourage students to use information technology to better complete the learning objectives. This can not only guide students to preliminarily understand the quadratic form, but also enhance their awareness of independent learning, so as to ensure the smooth realization of teaching objectives.

2. Enrich teaching resources

In information-based teaching activities, it is necessary to pay attention to the enrichment of teaching resources. First, build a digital resource library and integrate the content of teaching materials into it to provide guarantee for teachers' teaching activities and students' independent learning. In addition, teachers can sort out knowledge points according to teaching objectives and content difficulties and carry out targeted teaching activities. Secondly, various high-quality teaching resources, including digital teaching materials, multimedia courseware, case studies, etc. are widely collected and sorted out to build multimedia databases. Through rich materials, we can optimize classroom teaching activities and improve students' enthusiasm for learning. Thirdly, colleges and universities will digitalize and sort out the teaching video resources of teachers, improve the teaching video library, lay the foundation for the development of students' independent learning, better solve the problems encountered in independent learning and improve the knowledge reserve. Fourth, colleges and universities need to pay attention to the development and use of online teaching platforms, improve teachers' awareness of and utilization rate of resource libraries, and encourage teachers to release teaching resources on the teaching platforms by recording teaching videos and writing teaching plans, so as to achieve the improvement of teaching effects.

3. Micro lessons are applied to the classroom

(1) Preview before class

In the development of mathematics courses in colleges and universities, it is necessary to take textbooks as the basis and improve the teaching plan. For example, when teaching the related content of functions, teachers can analyze the learning situation before teaching, take the improvement of students' mathematical application ability as the goal, and formulate targeted teaching plans based on the actual situation of students. In the pre-class preview, teachers can formulate hierarchical teaching plans, deepen students' grasp of knowledge with the help of mathematical formulas and regular micro-class videos, and solve relevant problems through the flexible application of mathematical knowledge when they encounter practical problems. When students master the basic knowledge with the help of micro-lesson videos, teachers can guide students to further study the knowledge, so that they can form good mathematical thinking. In addition, teachers need to pay attention to the improvement of students' cognitive ability, so as to better master mathematical knowledge. Through the integration of readable mathematical formulas and theorems, the form of pictures and videos can make knowledge more intuitive and improve students' knowledge reserve. For example, teachers can use the concept, principle and other knowledge of calculus to make related micro-lesson videos, and use pictures and videos to show the relevant laws of the definition domain and range domain. In order to show function concepts and principles more directly, teachers need to pay attention to the optimization of mind mapping, and deepen students' understanding of relevant mathematical knowledge with the help of micro-lesson videos. Teachers need to strengthen the integration of micro-lessons in the pre-class preview, have a deep understanding of the characteristics of college mathematics courses, and improve the teaching plan according to the procedure. Therefore, through the application of micro-lesson video in pre-class preview, teachers need to show mathematical formulas and principles more intuitively, help students better understand mathematical knowledge, and lay the foundation for future in-depth learning. Through the application of micro-lesson pre-class preview, students can have a deep understanding of mathematical formulas and theorems, better apply mathematical knowledge in practical activities, and improve the reality and educational significance of teaching.

(2) Classroom teaching

The application of micro-lesson video in mathematics courses in colleges and universities is helpful to the improvement of students' knowledge application ability. Teachers need to dig the content of textbooks and classify the knowledge. Based on the actual situation of students, they should design the content of micro-lessons well, pay attention to face-to-face teaching activities, and skillfully integrate micro-lessons into classroom teaching. In addition, teachers can enrich knowledge content by playing micro-lesson videos in classroom teaching, so that students can have a deep understanding of mathematical concepts and application principles. Based on the application of micro-lesson video in classroom teaching, it is necessary to make students have a deep understanding of knowledge and master the key and difficult knowledge in the explanation of knowledge. At the same time, teachers can proceed from the actual situation and carry out intensive training with the help of micro-lesson videos to consolidate their learning effect. Through the development of the above activities, it is conducive to the improvement of students' mathematical learning ability. In the face-to-face explanation of mathematics knowledge, teachers need to pay attention to the introduction of micro-lesson videos, form a good classroom atmosphere, and accelerate students' understanding of knowledge with the help of micro-lesson videos. For example, when explaining the content of differentiation, teachers need to have a deep

understanding of students' cognitive ability, and incorporate students' expressions and reactions into the micro-lesson videos according to their cognitive structure. Through the optimization of the video content and the use of humorous language features, students can actively integrate into the learning of mathematical knowledge and form a good cognitive ability. In the explanation activities of mathematics knowledge, teachers need to pay attention to the integration of micro-lesson videos, active thinking activities, so that students can have in-depth thinking and exploration of knowledge, produce objective and reasonable judgments, strengthen the connection between different knowledge, with the help of a good classroom environment, significantly improve students' mathematical literacy, and pave the way for subsequent learning and work.

(3) Review after class

In the teaching activities of mathematics courses in colleges and universities, after-class review plays a very important role. The development of this activity helps enrich students' knowledge reserves and provides reference for the development of subsequent teaching activities. In addition, teachers need to understand the actual situation of students, make targeted homework after class, and provide them with relevant teaching videos. After finishing the homework, students can watch the teaching video to understand the important and difficult contents of the course, so as to realize the effective connection of knowledge. Teachers can review after class, timely into the mathematics micro-lessons, in the teaching activities of sorting out the knowledge content, including this class, the next class, etc., to form an open homework, and according to the actual teaching content, to help students grasp good problem-solving ideas. In the design of micro-lessons, it is necessary to pay attention to the integration of problem solving ideas, so that students can master good problem-solving skills through watching micro-lesson videos. In addition, teachers can raise different types of questions to improve students' problem-solving ability. In micro-lesson videos, teachers should focus on introducing new problem-solving ideas to improve students' knowledge reserve and lay a foundation for the follow-up learning activities. Teachers can pay attention to the introduction of mathematical problem solving process in micro-lessons, strengthen the connection between knowledge, highlight the key content in teaching activities, and realize the effective connection between learning behavior and content. Teachers need to take the improvement of students' knowledge ability as their goal, design reasonable micro-lesson content, and highlight its role and value in after-class review activities.

4. Innovate the evaluation system

The implementation of education informatization is a long-term process, which needs to be paid attention to in many aspects, such as concept renewal, classroom implementation and improvement of evaluation system. In the process of constructing the evaluation system, special attention should be paid to the organic integration of theory and practice, and process evaluation should be carried out, so that teachers can form a more intuitive and in-depth understanding of students. At the same time, we must also realize that with the development of information technology, there have emerged many new evaluation models, such as performance evaluation, intelligent evaluation and so on. The emergence of these new evaluation models not only promotes the transformation of teaching evaluation, but also injects new vitality into the process of education informatization. In practice, we should actively explore and improve the evaluation system to ensure its scientificity, objectivity and impartiality.

IV. Concluding Remarks

To sum up, the degree of education informatization is gradually deepening, and the application of information technology in mathematics courses in colleges and universities is more extensive, mainly reflected in teaching resources, classroom teaching, evaluation system and so on. In the actual teaching activities, teachers need to pay attention to the optimization of teaching concepts, respect the principal position of students, and lay the foundation for the development of information-based teaching. In addition, teachers also need to apply advanced technology to all kinds of teaching links, so that students can actively participate in knowledge exploration activities, and realize the improvement of teaching quality.

References:

[1] Hui Liang,Xiaoying Sun. Exploration of Higher Education Mathematics Teaching Reform Based on Innovative Ability Cultivation [J]. Industry and Technology Forum, 2021-20 (16): 194-195.

[2] Peimin Mao. Exploration and Practice of Improving the Informatization Teaching Ability of College Mathematics Teachers under the Background of "Internet plus" [J]. Digital World, 2020, (11): 191-192.

[3] Liang Zeng. Research on the Reform of Higher Mathematics Teaching of Economics and Management in Applied undergraduate universities under the Information environment [J]. China Management Information Technology, 2019,23(19):222-224.

[4] Jingjing Liu. College Mathematics Course Teaching based on MATLAB software in the background of information Education [J]. Electronic testing, 2016, (23) : 106 + 117. DOI: 10.16520 / j.carol carroll nki. 1000-8519.2016.23.062.