The Infiltration of Mathematical Modeling Thoughts in College Mathematics Teaching

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Abstract: Integrating mathematical modeling into the process of higher mathematics teaching in universities is crucial to the cultivation of students' practical and innovative abilities. It is the mainstream direction of reforming mathematics teaching in universities under the new situation, and will play a decisive role in the teaching effect of mathematics in higher education institutions. This paper begins with the basic meaning of mathematical modeling thoughts, analyzes the importance of introducing mathematical modeling ideas in college mathematics teaching, and finally puts forward the specific countermeasures to infiltrate mathematical modeling ideas into university mathematics teaching. It provides useful reference for improving the mathematics teaching effect in colleges and universities.

1. Introduction
In recent years, the reform of higher education has become more in-depth. How to make the status of student constructors prominent in mathematics teaching and the cultivation of college students' initiative has become the mainstream of reform. At this stage, the employment situation is becoming more severe, and colleges and universities are more focused on cultivating students' comprehensive abilities, which in turn can help students change their roles as soon as possible, adapt to their needs better and handle various problems properly. The higher mathematics curriculum is mainly to help students master some theorems and methods related to mathematics, cultivate their ability to think independently and comprehensively, and then apply what they have learned to effectively solve various practical problems, instead of focusing on instilling knowledge and applying the problem solving tactics. The idea of mathematical modeling helps the students' mathematics interest to stimulate and facilitate better thinking and understanding of various abstract problems, which helps to promote the significant improvement of college students' application consciousness. To this end, many educational experts have suggested that mathematical modeling ideas should be infiltrated into the university mathematics teaching process.

2. Basic Introduction to Mathematical Modeling Ideas
The so-called mathematical modeling is mainly the process of constructing a specific mathematical model to face the various problems in the real world, that is, by abstracting and simplifying the actual problem, the variables and parameters can be determined. On this basis, some "laws" are used. "You can establish mathematical problems that determine variables and parameters, and solve mathematical problems. Then you can interpret and verify the resulting solution to determine whether it can be used to solve the actual problem multiple times. This is a deepening study and an important process with the cycle. According to the definition, the standard of mathematical modeling is not fixed. There are many processing methods used in the same problem solving process, and the ideas are very flexible.
3. Importance of Introducing Mathematical Modeling Thoughts into College Mathematics Teaching

At this stage, the infiltration teaching modeling ideas are widely used in the teaching of higher mathematics in China's universities to help them gradually realize their importance in mathematics teaching. In the actual teaching process, because the traditional methods are still used, the content of the teaching is more unified. It is difficult to highlight the personality of the students to a certain extent, and it will also seriously hinder the growth and creativity of the students' individuality. Therefore, regarding the current high level of the teaching requirements of mathematics are difficult to satisfy [3]. After infiltrating the mathematical modeling ideas in classroom teaching, it can help teachers to pay more attention to students' mathematical thought, and instead focus on cultivating students' mathematical practice innovation ability. Teachers can use more advanced mathematics knowledge ways to fully mobilize the enthusiasm of students, guide students to speak actively in the classroom, actively discover and ask questions, and then through active discussion and communication, to ensure that the problem can be effectively solved, so that they can effectively exercise and develop students' mathematical thinking [4].

4. Specific countermeasure analysis

When solving problems it is helpful for students to model their thoughts. In the ladder of higher mathematics, there are many ways to solve problems, such as drawing, list, column equations, etc., so it is relatively flexible to choose the appropriate way to solve the problem. For this reason, teachers need to be able to carry out the rules and characteristics of various problem-solving methods. Mastering, through effective guidance in effective classroom teaching, students can choose a more efficient method [5]. When cultivating students' modeling ideas, the most crucial step is to systematically transfer knowledge to students, and then through continuous reinforcement exercises, scientifically test the methods that have been mastered. However, no matter how strong the students are, they will encounter problems that are difficult to solve. In the face of such problems, if students can judge and analyze the answers based on their own learning, it proves that mathematical modeling thinking has been initially formed, and then through the penetration of this idea, good results can be achieved. At this point, teachers need to strengthen their guidance to students so that they can use a variety of techniques to analyze and solve these problems in order to help students better understand the content, they can draw visual maps to better solve practical problems and ensure that they can better solve practical problems. It can carry out the teaching of advanced mathematics normally, make full use of the form. The application of the form can better arrange the mathematical information and help students to better use various mathematical problems in the process of higher mathematics learning [6].

4.1 Maximum and Minimum Problem

The maximum and minimum problem is one of the important contents of the composition of higher mathematics, mainly refers to using derivatives to effectively solve the most value problems in various real life. The key to learning the derivatives is to better solve the most value problems [7]. First, the introduction of the mathematical model of “Rainbow of the Sky” means that “the raindrops have not completely disappeared after a heavy rain. A beautiful rainbow is present in front of people. Rainbow is a natural phenomenon, but why does the rainbow have color? How is the rainbow formed? Why the shape of the rainbow is an arc, and the color has a certain regularity? What determines the height of the rainbow? After the teacher raised this series of questions, the students began to think and actively discuss the question. The speech, it is known that the rainbow is mainly caused by the reflection and refraction of the raindrops. The formation of the deflection angle of the sunlight is related to the reflection and refraction of the light. The maximum value of the deflection angle of the sunlight can be calculated by means of the derivative. After that, scientific predictions can be made about the time of the next rainbow [8].
4.2 Application of Closed Interval Continuous Function

The continuous function on the closed interval has a strong theoretical nature. After a brief introduction, the teacher can introduce the "stiff stability problem" model according to the relevant content: "University mathematics seems have nothing to do with the stability problem of the chair, why study the stability of the chair? How can the chair be stabilized on the uneven ground?" At this point, the student will think about how to use knowledge to solve it. For this reason, the nature of the continuous function on the closed interval needs to be understood, and students have deeper understanding of the importance of mathematical modeling [9].

4.3 Differential Equation

Differential equations have now been widely applied to all aspects of life, which is the best way to solve them effectively. For example, losing weight is more common in daily life. According to the relevant content, the differential equation can be established and scientifically solved. On this basis, the “mathematical model of weight loss” is introduced, that is, in recent years, with people's living standards and conditions, with the continuous improvement, people's fat content is increasing, obesity has become a hot topic, and every obese person is most concerned about how to lose weight correctly. The two most important factors are persistence exercise and diet control. After the differential equation model is established, it can help people to lose weight more effectively [10].

4.4 Application of Definite Integral

Definite integrals have great application value in advanced mathematics, mainly in the form of geometry in real life. For example, in 1999, the National College Student Mathematical Contest in Modeling C, “The accumulation of coal gangue”, coal gangue is a kind of useless waste that will inevitably appear when actually mining coal. This is the first time that the problem of definite integral is introduced as important content [11]. When the meteorite is placed in a flat area, the land must be used, but it must be planned. It must not be blindly piled up to avoid unnecessary waste of the land. To this end, it is necessary to study how to collect land based on funding, design annual production and expected years of mining. After mastering these basic contents, students can directly predict the amount of exploitation. Its application can be embodied in many aspects. After simply understanding the general application, students can realize the importance of definite points and mobilize their enthusiasm for participating in the competition.

4.5 Conditional Probability

Conditional probability is the most important part of probability and is very close to our real life. For example, in the face of the thorny problems in real life, the method of arresting is usually adopted, and the fairness of this method is worth considering. Therefore, students can combine daily life problems and think in the process of mathematics, so that they can better understand and grasp the relatively boring mathematical concepts, so as to better promote the improvement of students' mathematics learning ability. When the class is about to end, you can set up an open-type homework assignment as the “Monte Hall problem”. Students can stimulate interest in probability theory in the process of learning and thinking, which in turn helps to promote the initiative and enthusiasm of learning and it also can achieve significant teaching results [12].

5. Constructing Mathematical Modeling Activities to Promote Significant Improvement of Students' Comprehensive Quality

There are many types of mathematical modeling activities, including mathematical modeling courses, mathematical modeling training and competitions, which can help students better understand mathematics knowledge and truly apply what they have learned so that they can use what they have learned to solve. Various practical problems, through the mutual attention between students in the process of analysis and resolution of problems, it can exercise their own thinking ability, quickly transform various practical problems into mathematical problems, and establish relevant mathematical
models to better solve the problem, and finally through the research and analysis can draw the corresponding data, and form a certain written material [13]. This will correspondingly improve the requirements for teachers, professional level and problem-solving ability must be high, committed to the transformation of the traditional "cramming" teaching method, using the "research and discussion" method to help students to learn independently, only independent thinking in order to help students strengthen the mastery and learning of modeling knowledge under the guidance of teachers. At the same time, choosing the appropriate modeling case is also an effective method. With these cases, students can be better analyzed and researched. Through the arrangement of new mathematical modeling topics, students can be guided to group discussions and through problem analysis. Model building, hypothesis and solution, etc., will help to better write relevant papers.

6. Conclusion
By studying advanced mathematics, college students can better solve various problems faced in life and work in the future. Through the infiltration of mathematical modeling ideas, they have deepened their understanding of related concepts and theorems, and then realized the theory and practice and unity, focusing on the ability to solve problems and comprehensive literacy, it has achieved remarkable results in a large number of teaching practices. For this reason, mathematical modeling can be actively infiltrated into mathematics teaching.

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