Teaching Research Based on Mathematical Model Method

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Abstract: With the rapid development of information technology, the application of mathematical theory knowledge is more common. In the new era, it is very important to have the ability to apply mathematical theories. Mathematical thought is the soul of mathematical method, and mathematical method is the manifestation of mathematical thought and the means to realize it. The teaching of mathematical modeling is mostly confined to the solution of specific mathematical modeling problems and often ignores the teaching of mathematical modeling methods. Mathematics thought method and mathematics basic knowledge are two organic components of mathematics content, and also constitute the content of mathematics teaching. In order to fully enhance the interest in mathematics modeling of higher vocational students, the efficiency of mathematics teaching in higher vocational colleges is enhanced. Based on the current situation of mathematics teaching in higher vocational colleges, this paper studies the integration of mathematical modeling methods into mathematics teaching in higher vocational colleges. In the process of learning, it is necessary to combine various abstract concept theories and strive to join the practice, in order to meet the social needs and educational needs of the new era, and lay a solid foundation for the personal development of students.

1. Introduction

With the rapid development of information technology, the application of mathematical theory knowledge is more common. In the new era, it is very important to have the ability to apply mathematical theories [1]. Mathematical thinking methods and mathematical basic knowledge are two organic components of mathematical content, and also constitute the content of mathematical teaching [2]. For domestic higher education, improving students' individual quality is the fundamental goal and practical direction. The specific dimensions include students' individual abstract thinking ability, spatial imagination ability, logical reasoning ability, etc. [3]. Mathematics is an important subject. In the teaching process, teachers should not only let students understand the basic theoretical knowledge of this subject, but also combine the talent education policy of higher vocational colleges to train high-quality practical talents for the society [4]. Although many colleges and universities in our country have offered mathematics modeling courses at present, the teaching effect is not ideal due to the lack of scientific and effective theoretical guidance. Mathematical thought is the soul of mathematical method, and mathematical method is the manifestation of mathematical thought and the means to realize it [5]. Mathematical modeling teaching is mostly related to the solution of specific mathematical modeling problems, and often ignores the teaching of mathematical modeling methods. Mathematical modeling is an international trend in mathematics teaching. With the development of international globalization, China must conform to the development of the times and keep up with the international pace.

As an important subject in higher education, mathematics is not only conducive to the improvement of students' digital computing ability, but also to the promotion of the overall thinking logic ability. Mathematical thinking has the classification characteristics and intellectual qualities of general thinking, but it also has its particularity [6]. The formation of mathematical thinking is not a day's work. In the usual teaching process, we must not only understand the laws and meanings of the teaching content itself, but also the overall concept as a guide [7]. In educators and educated people, the understanding is not completely consistent. Some teachers think that there is not much need, and some students use it as a burden [8]. In educators and educated people, the understanding

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is not completely consistent. Some teachers think that there is not much need, and some students use it as a burden, which will directly affect the progress and effect of this teaching work [9]. Developing mathematical modeling courses to develop students' mathematical modeling skills is mainly to cultivate students' application ability and innovative ability. Effective use of mathematical methods to establish mathematical models to solve practical problems can play a mathematical application function, and is conducive to improving the mathematics application ability of college students. To this end, the research on the establishment of strategies for the establishment of mathematical modeling methods in colleges and universities has important guiding significance for the teaching of mathematical modeling in colleges and universities.

2. The Difference between Mathematical Thinking Methods and Mathematical Basic Knowledge

2.1 The Difference between Mathematical Thinking Methods and Mathematical Basic Knowledge Quality

According to the actual research, the significance of introducing various modeling methods in mathematics education includes the following dimensions. The introduction of mathematical modeling methods in higher mathematics teaching conforms to the current teaching reform and quality education requirements in colleges and universities. Students can improve their ability to analyze and solve problems by learning mathematical modeling courses, understanding mathematical theories and mastering mathematical modeling methods. The goal of mathematics teaching in higher vocational colleges is to train students to master and apply mathematical theory knowledge, and to enable students to flexibly use mathematical operation ability and calculation tools in professional courses. Although the mathematical thinking method is specifically reflected in the basic knowledge, the teaching of mathematical knowledge can not replace the teaching of mathematical thinking methods. The two have qualitative differences and quantitative differences. Mathematical teaching provides an important means for students to grasp the overall knowledge of mathematics, enabling students to form a unified concept. When students are thinking about mathematics, especially complex mathematics, they can present a holistic image in their minds. Only recognize the reality of reason, do not recognize the reality of experience, thinking that only rationality can be relied upon. Knowledge teaching is the transmission of information, while the teaching of ideas and methods is the training of forming ideas and skills.

2.2 Differences between Mathematical Thinking Methods and Mathematical Basic Knowledge Quantity

Mathematical knowledge is the result of cognition. Mathematical thought is the basic viewpoint in cognition activities. Mathematical methods provide ideas, logical means and operating principles for mathematical activities. There are qualitative differences between them. With the development of scientific research and technological means, human beings have made great progress in the study of how the brain conducts thinking. In order to cultivate students' creativity, students must understand the essence of mathematics, which requires the education of thoughts and methods in mathematics education. A simple and effective method to analyze the relationship between mathematical learning and cultivation of mathematical thinking is the hypothesis test of two independent sample methods. A college math teacher teaches the same subject in three classes at the same time. In the student evaluation, the teacher's evaluation data are shown in Table 1.

Table 1 Student evaluation data of two independent sample means

Sample size	The average score	Sample standard deviation
65	84	4.9
63	76	4.3
58	81	5.2

For college students, the most important learning goal is to learn autonomous learning and

research. Therefore, combining modeling methods to explore the path of autonomous learning is a good educational experience help. In teaching, we should provide the actual background of basic mathematical knowledge, reflect the applied value of mathematics, and carry out some mathematical modeling activities appropriately. Under the concept of the new curriculum, teachers should try their best to arrange modeling activities or hold modeling competitions for students, provide students with relevant materials to support mathematical modeling, and cultivate students' application awareness [10]. Mathematics mainly explores and studies the objective world from the aspect of quantity, and any object or thing in the objective world is the unity of opposites between quality and quantity. In this infinitely complex world, any set or sets of axioms cannot exhaust all relationships between things. This is not a philosophical conjecture, but a mathematical theorem. The teaching of mathematical thinking methods always depends on the teaching of mathematical knowledge, and the teaching of mathematical knowledge cannot be separated from mathematical thinking methods at all.

3. Significance of Introducing Modeling Method into Mathematics Learning

Mathematical thinking methods produce mathematical knowledge, which in turn contains thinking methods. Their dialectical unity determines their unity in teaching. The teaching of mathematical knowledge is the teaching of the results of mathematical activities, focusing on memory and understanding, while the teaching of mathematical thinking and methods is the teaching of the process of mathematical activities, focusing on speculative operation and mastering skills. In actual learning, there is no specific answer and reconciliation in mathematics learning, that is to say, there may be multiple solutions to one question or multiple ways of answering. However, in the traditional learning mode, achievement is the basic orientation and requirement mode. Therefore, too much attention to score is the choice of many people. The improvement of the curriculum into the new stage of further development, the development of students' core literacy as the top priority of this curriculum reform, core literacy will become the main line of the new curriculum design. Cultivating students' core literacy is to cultivate students' comprehensive ability. Mathematical modeling is one of the important contents of mathematics core literacy.

In addition to having a certain amount of experience and knowledge, students must have keen insight and imagination. In the past teaching process, students are always dealing with a large number of calculation formulas, and students only have the ability to deal with technical problems. Therefore, higher vocational colleges should adjust their teaching ideas in a timely manner, innovate educational methods, and strengthen the training of students' mathematical modeling ability. In teaching, the social development of students is mainly realized through communication and cooperation behaviors. The communication and cooperation between students and students, students and teachers are beneficial to the social development of students. The interactive relationship of students' social development is shown in Fig. 1.

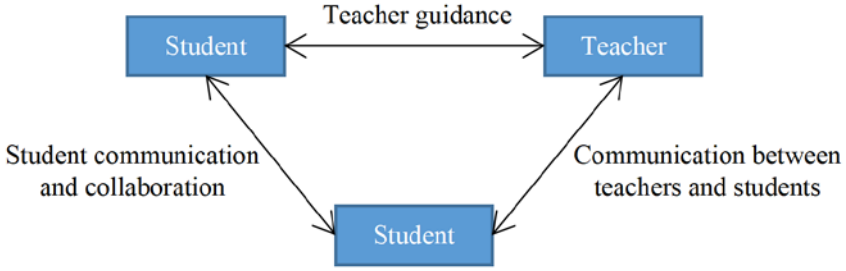

Figure 1 Student social development interaction

To cultivate students' innovative consciousness through mathematics teaching, it is necessary to cultivate students' innovative spirit and innovative ability in mathematics classroom teaching. The big data software is convenient and efficient to generate wrong problem books automatically based on the collection process of several sets. At the same time, students can mark the wrong reasons for each wrong problem. Cultivating students' mathematical thinking ability is a long-term and arduous

task, which requires teachers to run through the activities of cultivating students' thinking in daily teaching. Each class will have some strong learning ability, for the knowledge in the class, can quickly grasp and flexible use. However, some students have weak learning ability and cannot solve the problems well. For classes with abnormal data, whether high or low, it is worth further analysis and research. If you develop students' mathematical thinking ability, it will help solve the problem of students' differences in learning ability. According to the teaching content, the staged review of key knowledge and important ability in the development of the work should be reproduced or advanced.

Higher education needs to be adjusted and changed in light of the needs of the times. In the past, traditional students in the traditional mode of teaching felt that they were uninterested and lost interest, but the introduction of modeling methods would bring new levels of challenges to students. From the perspective of the teacher, by incorporating mathematical modeling into the teaching, students can master the various models of the function more quickly. Keeping the function model in the minds of students is conducive to deepening students' learning impressions and reducing teaching tasks. In order to further highlight the role of mathematical modeling methods, teaching should focus on multiple associations and correctly understand the different aspects of mathematical modeling methods. In the process of teaching, teachers should combine the students' learning ability and teaching content to design the content of the modeling activities for students. We should flexibly use teaching cases to introduce key points, and integrate mathematical modeling ideas in the process of demonstration and conversion to promote students' understanding of mathematical modeling ideas. In mathematics, the difficulty can be better broken through by consciously using mathematical thinking methods to guide the formation of concepts and the discovery of knowledge. Therefore, in mathematics education, teachers should try their best to encourage students to innovate independently in actual modeling and learn effective learning modes while mastering mathematics knowledge. This is a very beneficial approach to the future growth of students and an important promotion to the overall progress of mathematics education.

4. Conclusion

A mathematical modeling method that effectively uses mathematical methods to establish mathematical models to solve practical problems can give full play to the application function of mathematics. It is of great significance to carry out research on effective strategies of mathematical modeling methods in colleges and universities, which is helpful to guide the teaching practice of mathematical modeling. In the mathematics teaching of higher vocational colleges, the teaching reform and practice of mathematical modeling ideas are integrated. As the leader of teaching, teachers effectively combine mathematical knowledge with modeling ideas in the teaching process to improve students' ability to apply and innovate mathematical knowledge. The thinking method of mathematics exists in the solution of mathematical problems. The transformation of mathematical problems step by step follows the direction indicated by the thinking method of mathematics. Mathematical thinking method is the essence of mathematical knowledge. The solution of mathematical problems can not be separated from the guidance, application and innovation of mathematical thinking method. Teachers need to integrate the actual situation, on the basis of full investigation and research, introduce modeling methods, improve students'problem solving ability and interest, and lay a solid foundation for students' personal development. The importance of mathematical modeling in high school learning can not only cultivate students'application consciousness and innovation consciousness, but also cultivate students' comprehensive ability, which has broad prospects.

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