

Reform and Innovation of Higher Mathematics Curriculum Teaching under the background of Innovative Education

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Abstract: In recent years, with the progress and development of the times, the way of education shows an innovative trend, higher mathematics teaching should change the thought of examination-oriented education, and transform the goal of education into the cultivation of students' mathematical thinking and core accomplishment. In order to improve the students' ability of mathematics creation and application, the author analyzes and explores a more perfect way of reform and innovation.

1. The Meaning and Advantages of 1. Innovation and Entrepreneurship Education

In order to achieve better quality of higher mathematics teaching, schools should consider reforming the teaching methods of higher mathematics, focusing on cultivating students' innovative thinking, core accomplishment and comprehensive quality[1]. The following is a brief analysis and discussion on the basic connotation and advantages of innovative entrepreneurship education:

As the demand of the current society for education, innovative entrepreneurship education advocates the cultivation of students' innovative thinking, ability and consciousness, so that students can better adapt to the needs and development of the market and society. Its characteristics are as follows: first, innovation. Change the teaching method to adapt to the innovative and entrepreneurial goals of the new era, constantly analyze, explore, practice, fully explore the potential and open up a new market; second, create. Under the premise of conforming to the law of market development, we should arouse students' subjective initiative, arouse students' bold and innovative imagination and practice, and be the vanguard of opening up new ways in a certain field. Only by putting students' innovative ideas into practice can we show the concept and value of innovative entrepreneurship education[2].



Figure 1 Innovative entrepreneurship education

2. Existing Problems in Teaching Higher Mathematics Courses

The existing problems in the teaching of higher mathematics courses can be manifested in three aspects: first, the content of teaching materials is relatively old and lack of innovation; second, the enthusiasm of students is not high; third, the comprehensive quality of teachers needs to be improved. Details are as follows:

2.1. The Teaching Materials are Old and Lack of Innovation

Higher mathematics merges closely, systematically and abstractly, but at present, the content of higher mathematics teaching materials is old, which does not conform to the teaching of students in the new era, which is relatively "difficult, partial and old ". In the classroom teaching, teachers pay more attention to the derivation process of theoretical knowledge and the explanation of problem-solving skills, lack of practice, applied teaching content, mathematics experiment, modeling and other teaching modules, and in the connection with other subjects are relatively stiff. Such common problems, in essence, ignore the students' feelings, make it difficult for students to mention their interest in learning, to play the role of higher mathematics teaching, and to influence the improvement of students' thinking ability in mathematics.



Figure 2 Innovative entrepreneurship education

2.2. Students are not Highly Motivated to Study

Under the restriction of traditional examination-oriented education, it is difficult for some students to understand the abstract concept of higher mathematics knowledge in the stiff and rigid classroom teaching, which has greatly undermined the students' learning initiative in the long run, and it is more difficult to apply the high-number knowledge to solve problems flexibly in their life[3].

2.3. The Comprehensive Quality of Teachers Needs to be Improved

At present, the teaching of higher mathematics still follows the characteristics of subject-based teaching in the past, some teachers can not accept the changes brought by innovation and entrepreneurship education in time, and fail to reflect the new requirements of higher mathematics teaching under this background. The problem is particularly obvious in practical activities, lack of mathematical experiments, modeling and other activities of the organization and development, pay more attention to written knowledge teaching, ignoring the practical application of mathematical results and importance.

3. Analysis on the Reform Path of Higher Mathematics Teaching in the Context of Innovation and Entrepreneurship

Under the background of innovation and entrepreneurship, the reform path of higher mathematics teaching can be summarized into five aspects. The details are as follows:

3.1. Changing Educational Concepts and Reorienting Curriculum Objectives

Nowadays, we advocate the education of innovation and entrepreneurship, focusing on cultivating talents' consciousness and ability of innovation and entrepreneurship. Therefore, for higher mathematics teaching, we must take into account the characteristics of the subject and market demand, fully integrate innovative entrepreneurship education and higher mathematics teaching. Analyze and explore the entry point of higher mathematics teaching reform, renew the traditional talent cultivation concept, reform and promote the existing teaching system, and better

promote the development of higher mathematics teaching in the new era.

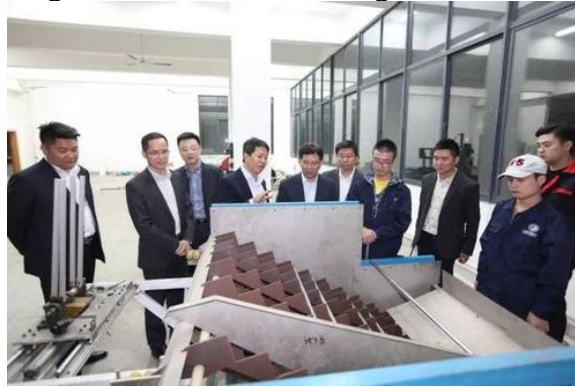


Figure 3 Innovation and entrepreneurship

3.2. Reform of Teaching Materials

Reform the content of higher mathematics teaching materials to uphold the purpose of fostering innovative entrepreneurial ability. Considering the current situation that the students' knowledge base of mathematics is uneven and the whole weak, we can adjust the teaching material of "higher mathematics", and delete the theorem argumentation and derivation content which students generally think is too cumbersome. It is necessary not only to highlight the core knowledge, problem-solving ideas and verification theory of higher mathematics, but also to let students learn to think about what they have learned in the actual situation. To ensure that the teaching materials are concise and concise, so as to promote the students' learning initiative, combine the theory proof with the practical experiment, and make the students understand the idea of higher mathematics more intuitively[4].

3.3. Reform of Teaching Contents

Under the aim of reorienting and clarifying the goal of higher mathematics course, combining with the characteristics of students' study, the content of higher mathematics teaching is reformed. Start with the following:

One is based on the perspective of student growth. Based on the students' professional growth angle, the new teaching content should balance the relationship between mathematics knowledge and ability, mathematics literacy and application, and add the method of flexible application to practical problems, so as to expand students' application of higher mathematics knowledge and break the barrier between higher mathematics content and other subject systems. Infiltrate, combine other subject knowledge, comprehensively cultivate students' mathematics quality and ability.

The second is based on the perspective of innovative practice talent cultivation. Higher mathematics teaching pays attention to the practicality, application, openness and innovation of the curriculum, and wants to pay attention to the cultivation of students' innovative practical application ability, which should be extended from classroom knowledge teaching to extracurricular application. By means of mathematical cases, experiments and other activities, students can understand mathematical principles intuitively and deeply in practice. With the help of modern information technology, we can use mathematical software to solve problems, deepen students' understanding of higher mathematics knowledge, focus on cultivating students' rational spirit of mathematics, and integrate mathematical ideas and methods.

3.4. Combining Mathematical Modeling

The introduction of MATLAB into the higher mathematics experimental classroom, on the one hand, can be used to reason and demonstrate the mathematics physicochemical, on the other hand, can be more clearly and intuitively displayed to the students mathematical modeling ideas, let students understand, master the ideas and methods of mathematical modeling, make the solution of mathematical problems easier. The idea of mathematical modeling can be integrated into higher mathematics teaching in two ways:

One is the concept explanation. Mathematics as an abstract natural science, the concept explanation in the classroom should start with the students' familiar daily life, use the real life problem by analogy, transform and summarize the mathematical concept, and strengthen the students' understanding. For example, the concept of derivative explanation, the teacher can design the following questions: A and C meet somewhere, A from home to ride a bicycle to the destination time, distance known, how to calculate and determine the immediate speed of the journey? Only time is considered in this question. Next, we lead the students to establish the mathematical model, also called the function relation, so as to derive the derivative concept.

Second, mathematical examples. After the concept explanation, it is often the explanation and analysis of the related examples, which can guide the students to establish a simple model to solve the practical problems. After explaining the concept and essence of definite integral, we can use definite integral to establish mathematical model to generate function relation to solve practical problems such as average temperature and volume of object. After teaching the concept of differential equation, we can construct Malthus population model, element decay model and so on, connect knowledge with life, show the practical value of higher mathematics, enhance students' ability to apply mathematics, and achieve the teaching purpose of learning to use. Teachers can also organize practical activities such as mathematical modeling competition to enhance students' flexible construction of different mathematical models, explore potential in communication, and improve knowledge.

3.5. To Offer Experimental Courses in Mathematics to Strengthen Students' Practice and Innovative Spirit in Mathematics

In addition to the mathematics experiment course in the higher mathematics teaching, we can simplify, abstract, summarize and refine the practical problems with the help of the way of experimental simulation, and use the mathematical model and related methods to solve, test and interpret the practical problems. In addition, we can use Matlab, Mathematica, Maple and other mathematical related computer software to build mathematical models according to practical problems, through numerical calculation, numerical simulation to solve, verify, simulate and demonstrate practical problems more easily and systematically, and better improve students' ability of mathematical thinking, spatial imagination, computing ability and real life learning ability. In the teaching of the concept of limit mathematics, we can adopt the method of simulation by means of mathematical computer software, and dynamically present the process of changing the term n in the concept of limit. Students can participate in the operation practice of computer software independently in the computer room, experience and operate repeatedly in the software, so as to understand the meaning of "infinite approximation" in the concept of limit more intuitively and deeply. Therefore, the mathematics experiment course can simplify the more complex and obscure mathematical problems in the textbook, so that the traditional teachers can directly express the mathematical problems expressed by the tedious proof on the blackboard in the computer software, without the need for teachers to spend a lot of time and effort to expound the concept connotation, nor need the students' tedious calculation, greatly improve the students' understanding and innovative application ability, so as to train the students to become the high-quality talents needed for social development.

4. Conclusion

As can be seen from the above, in the context of the innovation and entrepreneurship education today, in order to achieve better results in mathematics teaching, teachers should improve and innovate the contents and methods of higher mathematics teaching according to the requirements of teaching and the specific conditions of students, guide students to take the initiative and explore innovative learning spirit, pay attention to mathematical modeling ideas and methods, add practical activities, introduce mathematical experimental courses, help students to better understand the course knowledge through modern science and technology, stimulate students' enthusiasm for innovation and improve their comprehensive literacy and level of mathematics.

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