

# **Analysis and Research of Higher Mathematics Teaching Methods Based on the Background of Innovation and Entrepreneurship Education**

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**Abstract:** Innovation and entrepreneurship education has been widely developed in recent years, and it has a great influence on various subjects in education. Higher mathematics knowledge has penetrated into many industry fields, so it is of great significance to study the teaching methods of higher mathematics in the context of innovation and entrepreneurship education. Based on the analysis of the integration of innovation and entrepreneurship education and higher mathematics teaching, this paper discusses the innovation and practice of higher mathematics teaching methods.

## **1. Introduction**

With the rapid development of science and technology, the importance of mathematics has become increasingly prominent in their mutual convergence and collision. It is increasingly integrated into all levels of scientific development and engineering technology, so the teaching and learning of higher mathematics is also very important. The higher mathematics teaching based on entrepreneurial education advocated today has positive significance for promoting the "learning" talent training mode to the "research-oriented" talent training mode. The study of entrepreneurship education in China began in the late 20th century and is now at a critical stage of rapid development, mainly in two aspects. On the one hand, it summarizes the experience gained from entrepreneurial education at home and abroad. On the other hand, it studies the practice of domestic entrepreneurship education. On the basis of earnestly analyzing the characteristics of innovation and entrepreneurship education, combined with China's own teaching practice and international teaching experience, this paper puts forward a new mode of higher mathematics innovation and entrepreneurship education--researching higher mathematics teaching, hoping to provide a new reference for higher mathematics teaching methods.

## **2. A new Model of Higher Mathematics Teaching Method under the Background of Innovation and Entrepreneurship Education**

The essence of higher mathematics research teaching. The core content of reforming teaching methods is to enhance students' innovative spirit and cultivate their corresponding innovation ability. Research-based teaching can develop students' innovative ability based on the requirements of innovative education. This kind of teaching mode highlights the cultivation of students' innovative education, transforms the main body of teaching from teachers to students, teachers participate in the guiding process, and adopts new teaching modes such as discussion, heuristic and participatory to guide students to establish the ability to think independently, allowing students to practice hands-on skills. The research-based teaching method highlights the student's dominant position and gives the student the leading role in the educational process.

The characteristics of higher mathematics research teaching. The main feature of higher mathematics research teaching is the emphasis on the process. Different from the traditional teaching, the focus is on the students' test scores. For the higher mathematics research-oriented teaching, the whole teaching process is more important than the results. The higher mathematics research-oriented teaching focuses on the students' learning process, focusing on the study of students' thinking methods and the cultivation of students' ability to think. Higher mathematics research-oriented teaching focuses on application, and applying the content of learning to practical

life is a major feature. Higher mathematics research-oriented teaching focuses on the use of students' knowledge, and the same class of teaching methods compares higher mathematics. Higher mathematics research-based teaching is more in line with students' life practices, so it can more effectively promote the training of students' practical ability. Higher mathematics research-oriented teaching focuses on experience. Higher mathematics research-based teaching not only pays attention to students' mastery of knowledge content in the learning process, but also pays attention to students' learning experience, so that students can participate in the spirit of innovation and innovation, go to practice activities and strengthen the process of experience. Higher mathematics research-oriented teaching focuses on teamwork. Higher mathematics research-based teaching encourages students to work in teams. In each of the small cooperative teams, each student develops a suitable learning plan based on his or her actual learning situation and personality characteristics, thereby achieving self-learning goals. In higher mathematics research-based teaching, teamwork is both a student's learning method and a student's learning goal. Through teamwork, students can learn from each other's strengths, make up for their own shortcomings, and use their strengths to promote teamwork awareness and ability.

### **3. The Main Problems in the Current Higher Mathematics Teaching in Colleges and Universities in China**

Higher mathematics in Chinese universities is a public basic course. There are a large number of students in the class. Generally speaking, the teaching is conducted in a large class. The ratio of teachers to students is quite small. Generally, a teacher has to face hundreds of students, which brings many difficulties to teachers' teaching. In addition, the mathematics foundation of students is different, which also brings challenges to teachers' teaching. At present, the teaching of higher mathematics teachers in many colleges and universities is still influenced by the traditional teaching mode. The traditional thinking leads to some difficult problems in higher mathematics teaching, which has seriously affected the entrepreneurship of future students and is not conducive to the future employment development of contemporary young students. Therefore, we must pay enough attention.

Insufficient understanding of importance. Because the relationship between higher mathematics and real life is not very close, and the mathematical knowledge is boring, with the current employment situation becoming increasingly severe. Most students are reluctant to spend more time studying boring basic subjects, but are more willing to spend their energy on subjects that improve their vocational skills related to future employment, and lose interest in higher mathematics. There are also students who have the idea of "temporary cravings" and have a clear understanding of the basics of higher mathematics. They think that it is also possible to cope with the exams in the future. This kind of thinking makes the initiative and enthusiasm of students' learning greatly influences.

Teachers have a single teaching method. There are many students who study higher mathematics. Most schools teach in large classes. Teachers lack sufficient time and energy to improve teaching methods, which makes it difficult for higher mathematics to carry out necessary reforms and innovations. As a result, the quality declines and it is difficult to meet the development requirements of the new situation. The higher mathematics teaching in colleges and universities still adopts the old model, which is generally led by teachers. The lack of effective communication between teachers and students seriously affects the students' initiative and enthusiasm for learning, and affects the improvement of the quality of higher mathematics teaching.

Teaching conditions are backward. Modern educational technologies such as computers and multimedia have not been deeply applied in teaching, and they cannot reflect the scientific concept of modern education and teaching. In an era when electronic technology is becoming increasingly hot and global, knowledge has not kept pace with the times, or just staying behind the rigid formulas, blackboards and other backward means, so it is impossible to enrich students' brains with new scientific and technological knowledge. Especially for college students who are thirsty for knowledge, it is undoubtedly a kind of strong desire for curiosity, and it is hindering their progress towards successful entrepreneurship.

There are many class members. Excessive class size has become a common phenomenon in higher education in China. A teacher's classroom situation corresponding to hundreds of students can be seen everywhere. However, in the field of higher mathematics innovation education, large class teaching will play a certain negative role. The reason is that due to the large number of people, the opportunities for interaction between students and teachers are limited. It is not every time there is an opportunity for communication in the classroom, so that students can't have a deeper understanding of knowledge. It is also impossible for a teacher to master the learning situation of all students in just a few minutes, which to some extent weakens the enthusiasm of students. The above-mentioned teaching methods and forms of education all make the students in the passive stage of the learning process, it is difficult for students to actively learn, which will make it difficult for Chinese college students to enter the ranks of the world's outstanding college students. Therefore, innovation and entrepreneurship education should start from changing the inherent teaching mode and create an excellent learning environment and learning conditions for contemporary college students.

#### **4. Exploration of Higher Mathematics Teaching under the Background of Innovation and Entrepreneurship Education**

In today's era, the importance of entrepreneurial innovation education is becoming more and more important, and China's higher mathematics education starts late in this area, and the starting point is low. Therefore, in the future development, it is necessary to strengthen research work in this area so that higher mathematics education can meet the needs of social development. Under the background of entrepreneurial innovation education, we must reform the old higher mathematics teaching mode and explore a new type of higher mathematics education method that is in line with the actual situation of Chinese education and the combination of entrepreneurial and innovative ideas.

In the teaching of higher mathematics, we must constantly improve and improve the students' awareness of entrepreneurial innovation ability. The first thing to do is to change the concept of teachers. Only when the concept of teachers is changed can we change the old ways of education and teaching. In the context of entrepreneurial innovation education, the old cramming teaching in the past has been difficult to meet the rapid development of the market economy. To this end, higher mathematics educators should permeate the sense of entrepreneurial innovation throughout the classroom teaching, and improve the awareness of higher education college students to constantly improve their entrepreneurial and innovative capabilities, in order to meet the rapid development of China's social economy. In the classroom, teachers can explain some examples of entrepreneurship and lead students to develop in the direction of innovation and entrepreneurship.

Improve the importance of students' research ability in higher mathematics teaching. In the context of innovation and entrepreneurship, practitioners of higher mathematics education should improve their research ability and attach importance to research-based teaching. The so-called research-based teaching is a student-centered teaching model. Teachers only play a guiding role and organizational role, mobilize the enthusiasm of students, let students actively participate in research and discussion, and cultivate students' awareness of entrepreneurial innovation. For example, students can be organized in the classroom to discuss and study some cases in higher mathematics applications, which can not only enhance students' connotation analysis of basic principles knowledge, but also improve students' innovative practice ability.

Change the old teaching model to cultivate students' creative ability in practice. Colleges and universities are the base for cultivating professional quality talents. Our higher education workers must closely integrate the actual development of the society and carry out targeted entrepreneurial design with higher mathematics. Higher mathematics education practitioners can lead students to entrepreneurial innovation practice activities. For example, while carrying out traditional higher mathematics education, it is possible to organize and solve corresponding project topics in the school in combination with higher self-features. In addition, you can also cooperate with the company in depth to give the students the practical problems encountered in the enterprise, and

effectively improve the students' ability to use higher mathematics knowledge to solve practical problems.

Teaching content is appropriate, and students' confidence in learning higher mathematics is improved. Higher mathematics education practitioners must adhere to the principle of “go from the easy to the difficult and complicated”, so that most students will not retreat because the curriculum is too difficult, and appropriate encouragement allows the imparted knowledge to be loved by students and also helps to improve students' self-confidence.

## 5. Summary

As the number of college graduates in colleges and universities in China increases year by year, the employment pressure faced by university graduates is increasing year by year. Therefore, innovation and entrepreneurship education is becoming more and more important. The innovative education of higher mathematics is of great significance to China's current innovation and entrepreneurship education. The innovative education of higher mathematics is the same as the essence of innovation and entrepreneurship education. It is aimed at cultivating students' innovation and practical ability. Under the background of entrepreneurial innovation education, it is of great significance to improve the education and teaching methods of higher mathematics traditions. Although China's traditional higher mathematics education has achieved certain results, it still cannot meet the educational concept of innovation and entrepreneurship, and it cannot meet the needs of the rapidly developing social economy for innovative talents. Therefore, college education practitioners should strengthen the cultivation of students' entrepreneurial innovation consciousness in the process of imparting knowledge, and cultivate more high-quality innovative and applied talents for China.

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