# Practical Research on Teaching Methods of Higher Mathematics Curriculum in Higher Vocational Colleges under the Background of Innovative Education

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**Abstract**: Since the innovation and entrepreneurship was put forward, it has been popular in colleges and universities all over the country. It also provides a new direction for the reform of teaching methods in colleges and universities. In the continuous improvement of colleges and universities, what remains unchanged is to cultivate compound talents with rich professional knowledge and excellent comprehensive quality. Higher mathematics is a course that college students must learn, so colleges and universities should put more thinking into the teaching methods of courses to make the teaching effect more obvious and improve the innovative and entrepreneurship ability of students. In this paper, the author mainly explores the relevant problems and reform programs that may exist in the reform of teaching methods of higher mathematics in higher vocational colleges in the context of the popularity of innovative education by combining with his own practical experience.

## 1. Introduction

The thinking of higher mathematics can help students better integrate their knowledge into all aspects of scientific development and technical research, so it is of great significance to carry out higher mathematics education for students of higher vocational colleges. Under the background of innovative education, it is a problem higher vocational colleges must consider in the continuous development that how to study the teaching methods of higher mathematics courses to help cultivate a batch of students with "higher mathematics thinking" and to help students better carry out innovative education and better stand firm in the future society.

## 2. The Shortcomings of Higher Mathematics Education in Higher Vocational Colleges under the Background of Innovative Education

With the continuous development of economy, and the superiority of higher mathematics has been self-evident, and its practicability has been in-depth in all aspects. Not only students majoring in science and engineering, but also students majoring in finance, statistics, economy has to study the courses of higher mathematics. But the curriculum system of higher mathematics education in China is difficult to help students face the form of rapid development directly and the actual needs of innovation and entrepreneurship. There are deficiencies in teaching methods, teaching concepts, and teaching conditions.

### 2.1. Majority of Students in Classroom

In modern college classrooms, the number of students, especially the number of students in public courses, is extremely large, which is the characteristics of classroom of colleges and universities in China. A teacher or a professor teaches hundreds of students in the classroom. However, under the background of innovative education, there is negative effect to teach students higher mathematics in large classes. With a large number of people, the inquiry of the classroom is

naturally reduced, the communication between the students and the teachers is drastically declining, and the students' learning of the knowledge is almost on the surface. Even if the teachers can fully transfer the knowledge in a short period of time, it is not sure that the students can absorb all the knowledge. Such teaching has a negative effect on the enthusiasm of students.

### 2.2. Limitation of Teaching Conditions

Teaching with computer and multimedia have shown limitations in higher mathematics classrooms. Many teachers still implement the teaching of higher mathematics with the use of blackboard, and the concept of science and technology to the teaching is still insufficient. Modern electronic technology is mature, and is popular all over the world. However, the teaching of higher mathematics still chooses rigid formulas and blackboards, and does not keep pace with the times, so that students can not enrich themselves with the use of new scientific knowledge. Students seeking knowledge and thirsty for science and technology may have a misunderstanding of knowledge to a large extent after seeing such a "nostalgic" teaching method, and believe that learning this knowledge cannot help them to carry out research on innovation and entrepreneurship.

### 2.3. The Old Teaching Concept and Teaching Model

The concept of exam-oriented education is deeply rooted, and the teacher-centered teaching method has been deeply rooted in the hearts of every educator and educatee. Students have abandoned the psychology of being masters in the classroom. The teaching method of teachers is still unitary, and the teaching activities are still in the mode situation. They blindly attach importance to self-rendering, show indifference to the acceptance of students' emotions and knowledge, and pay attention to the completion of self-teaching tasks, which makes students feel at a loss. In particular, the research on students' interests and concepts is not carried out. The choice of cramming teaching is completely in the most important position for cultivating students' innovative ability, making students uninterested in this course.

### 2.4. To Focus on Rigor and Neglect Thinking Teaching

The teaching characteristics of higher mathematics are elaborated on the rigor of mathematics, neglected in logical deduction and guiding the combination with knowledge of various subjects. The current higher mathematics textbooks in China are relatively rich in content. Teachers will make inference and interpretation of some content due to the length of teaching time, but there is no in-depth analysis and research on its application. For the questions with strong skills, they just choose to reduce the difficulty, which makes students pay more attention to the skills of answering questions when they study higher mathematics and show indifference to the process of thinking with hands and brains and that of rigorous reasoning and solving. It hinders the cultivation of students' mathematical thinking, and does not show the superiority of higher mathematics in the innovative education of students.

## 3. Research on the Teaching Methods of Higher Mathematics in Higher Vocational Colleges under the Innovative Education

In fact, the essence of higher mathematics teaching and innovative education is to cultivate and improve students' innovative ability. Such a teaching mechanism makes students actively discuss and participate in the education, so that they can actively change traditional preaching into research education. Teachers guide and help in this process students to better carry out the study. In this way, we can fully show the teaching concept of people-oriented. After completing the research of a certain knowledge, students' self-confidence has been significantly improved, and the leading role of teachers has been fully demonstrated, which makes students' imagination and independent inquiry ability greatly improved. In this process, students' inquiry thinking can also be reflected. The mathematical thinking formed in this process can also be better applied in various disciplines by students. On the other hand, higher mathematics is a course relatively focusing on practical application, and in the whole teaching stage, practice is emphasized to help students better

understand and develop their knowledge, so that students can understand the practical significance of the saying that practice is the only standard to test truth. When teaching, teachers need not only to pay attention to the learning process and experience of students, but also to guide students to use knowledge to solve practical problems. These theoretical knowledge and learning methods can help students better understand the knowledge, and also can achieve the learning attitude of learning to use, so that students can learn more from the use in the future learning and better improve their innovative thinking.

When conducting methodological research, teachers should first pay attention to the rationality and interest of education. In the higher mathematics teaching classroom, teachers first need to ensure the efficiency and quality of the course, and improve the rationality of the teaching methods, and innovate the teaching mode in these stages, so that students can constantly improve themselves under different market demands and meet the actual needs of the society. In teaching, teachers need to abandon traditional indoctrination education, conduct in-depth research on the scope and depth of knowledge, expand the scope, and tap the depth of knowledge, especially for different points, and focus on the teaching. For instance, in the face of students majoring in mechanical and electrical engineering, teachers should focus on helping them master Laplace transformation, and students majoring in biotechnology should focus on mastering fixed integral. In terms of teaching interest, teachers should understand that higher mathematics has certain difficulties for students themselves. If they still choose traditional teaching and draw a conclusion by bypassing the ten turns, students have lost themselves in the twists and turns. Therefore, teachers can choose an intuitive way to explain the content straightforward, and pay attention to language and ways to improve the fun of teaching.

Moreover, teachers should pay attention to the transformation of the teaching structure. Only paying attention to professional knowledge and skills, not optimizing and reforming the teaching and improving students' comprehensive ability, students will be eliminated by society, and innovative education is naturally on paper. The design of teaching curriculum should be based on knowledge, so that students can combine principles and occupations to turn higher mathematics knowledge into professional requirements. Course design should also be carried out from changes in market economy. Students' ability to solve problems should be focused on to develop their language expression ability. In addition, instructional design should also be accurately carried out according to the actual situation of students, so that students can match the actual needs of the profession by combining their actual ability. Finally, corresponding higher mathematics activities needs to be implemented to improve students' comprehensive ability.

Finally, teachers should attach importance to the cultivation of professional ability and comprehensive quality. Under the background of innovative education, the actual needs of enterprises become the key starting point for schools to cultivate students. Talents with certain professional ability and comprehensive quality are deeply loved by enterprises. Therefore, in higher mathematics teaching, it is also necessary to formulate relevant professional topics for subject analysis according to the actual characteristics of the course to guide students to solve problems and promote the cultivation of professional ability. In addition, the school-enterprise joint training method is selected, and some problems encountered by enterprises in real life are summarized, so that teachers and students can analyze the problem and propose solutions in the classroom, and students really feel the meaning of the combination of knowledge and occupation, and help improve the comprehensive ability of students.

## 4. Conclusion

With the continuous reform and development of science and technology, education has to face a new generation. Mathematics occupies an indelible position in the whole education stage, and its importance is in modern times that the spark of the intersection of knowledge and mathematical thinking and technology. Under the background of innovative education, colleges and universities should reform the curriculum actively, change the thinking, and reform the teaching methods according to the actual needs of modern society to cultivate a group of high-quality students with

innovative thinking and comprehensive quality.

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