Research on the Teaching Reform of University Mathematics Courses in the Context of Double First-class Construction

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Abstract: The construction of "double first-class" is an important strategy for the country to actively promote the construction of a strong country of higher education, and in the process of construction, how to carry out efficient reform of university mathematics courses is a research topic that needs attention. We should realize that the university mathematics curriculum has a strong basic support for the construction of "double first-class", and the teaching reform of the university mathematics curriculum should be carried out in conjunction with the actual teaching situation of the university. This paper puts forward the measures of teaching reform of university mathematics courses according to the background of "double first-class" construction and the actual teaching situation.

Keywords: Double first-class construction; University mathematics; Teaching reform

Introduction:

In the context of information globalization, China has made an important strategic decision of "double first-class" construction in order to achieve the goal of a strong higher education country, which is of great significance to the cultivation and development of national innovation capability. As an important compulsory course in many majors of higher education institutions, we should explore the reform measures of mathematics curriculum in order to strengthen the process of "double first-class" construction of a strong higher education country. Therefore, how to carry out the reform of mathematics curriculum has become an important research issue.

1. The need to reform the teaching of university mathematics courses

With the development of the new era, the development of science and technology is also progressing, and the contents of the professional courses of many higher education institutions have been relatively updated and changed, while the contents of the mathematics courses in colleges and universities have not been reformed following the update of the relevant professional contents. The lack of guidance for students and the difficulty to realize the renewal of the curriculum in the discovery and re-creation of mathematics are seriously incompatible with the development of mathematics education.[1] Currently, the curriculum of mathematics in universities is still single, and different majors maintain the same pattern of teaching mathematics courses, there is a serious disconnect between mathematics courses and professional courses, and there is also a disconnect between theory and practice, when the two cannot carry out articulated teaching, students cannot have a deep understanding of mathematical knowledge, and they cannot use it flexibly in the process of mathematics. In most mathematics classes, there is no curriculum arrangement for mathematical modeling and mathematical experiments, and students lack the opportunity to practice mathematics, which affects students' interest in learning mathematics and is not conducive to improving students' mathematical quality. In fact, mathematics is an indispensable and important tool for the study of science and technology, and plays a fundamental role in the cultivation of high-quality talents in science and technology, and occupies an important position in the curriculum of science and technology majors. It can be said that the teaching of mathematics plays an important role in the cultivation of scientific elites in science and technology, and even influences the material life of human society in all aspects. Therefore, the teaching of mathematics courses is an essential part of the construction of "double first-class", and the construction of "double first-class" in higher education institutions cannot be achieved without the strong support of mathematics course education.

2. Measures to reform the teaching of university mathematics courses

2.1 Promote the reform of the university mathematics curriculum

In view of the current imperfections in the university mathematics education curriculum, we can promote the reform of the university mathematics curriculum system by taking into account the actual situation of mathematics curriculum teaching in institutions. Along with the continuous expansion of higher education institutions, the threshold of "double first-class" universities has been decreasing year after year, which makes the gap between students' mathematical foundation and mathematical ability bigger or smaller. In response to this situation, colleges and universities can carry out mathematics teaching activities according to students' needs. Firstly, for students who meet the basic score requirements of undergraduate mathematics courses required by the Ministry of Education, the difficulty of university mathematics courses can be appropriately reduced according to their actual performance, and at the same time, in order to meet students with higher requirements for mathematics learning, elective courses in mathematics can be added.[2] . For example, we can set up elective courses of mathematical modeling in various majors to meet the high requirements of some students in the study of applied mathematics; we can set up elective courses of mathematics for the examination of some students to improve the rate of advancement; we can also offer mathematical analysis to meet the study needs of other non-mathematical science and technology majors, so that students can learn the mathematical foundation for their future professional courses. To improve the curriculum and teaching system of university mathematics, and actively explore the reform measures of university mathematics curriculum to meet the needs of different learning needs and learning ability, which can help cultivate talents of multiple majors and play an effective role in the construction of "double first-class".

2.2 Graded teaching and classified instruction

A graded and categorized mathematics curriculum should be implemented. Most institutions of higher learning are comprehensive universities containing many different majors, and many majors have a mix of arts and science enrollment, resulting in a certain gap in mathematical literacy among college students on campus, and these students have different needs for mathematics learning. Some students may just want to finish their undergraduate degree and do well in mathematics without delaying graduation, while others may decide from the time they enroll to further their education and continue upward to get a degree, so they have very high demands on their mathematics learning and will not be satisfied with the learning needs of their major. In this context, schools can divide the study of advanced mathematics into three levels: A, B and C. The standard of A-level mathematics is the highest, with the scientific and rigorous nature of mathematics as the main focus and rich teaching content to meet the needs of students majoring in science and technology and students preparing for graduate school; B-level is mainly applied mathematics, mainly designed for teaching mathematics courses with students majoring in economics and management, which only needs to understand the basic ideas of mathematics and master the basic methods of application. B level is mainly designed for students majoring in economics and management, who only need to understand the basic ideas of mathematics and master the basic methods of application. Finally, Level C is designed for students with a liberal arts background and is designed to enhance their understanding of the basic ideas of mathematics, with relatively low requirements.

2.3 Promote close articulation between professional courses and university mathematics courses

University mathematics has a very rigorous curriculum structure and contains relatively stable knowledge points, so it is important to adapt it to the mathematical learning requirements of different majors and to closely connect the professional courses with the university mathematics curriculum. The key to the implementation of this measure is the selection of suitable topics and cases, aiming to highlight the role of university mathematics knowledge prayer in the process of solving problems with relevant professional knowledge, so that students can analyze and solve practical problems in the process of enhancing the learning ability of mathematics, improving the quality of mathematics, and experiencing the important application of mathematical knowledge in the application of practical problems. For example, when students of economics and management majors study mathematics, they can introduce models such as optimal price model and spider web model; in the classroom study of linear algebra, they can introduce models such as commodity market share problem, calculation of product cost and price equilibrium model; when they study the content of probability theory and mathematical statistics, they can introduce models such as rational allocation problem, insurance company's income and encounter problem. According to the needs of different professional knowledge, the mathematics teaching teams of different professional disciplines are established to strengthen the connection and docking of mathematics courses and professional courses.

2.4 Strengthen the connection between college mathematics and high school mathematics

In recent years, high school mathematics textbooks have been reformed into a modular approach that differs from traditional

teaching, expanding mathematical content while reducing the difficulty of learning mathematics content, which differs greatly from traditional high school mathematics textbooks. For example, the definition of limit in the high school mathematics textbook is explained only in the expression of stereotypical concepts, and the derivative is only introduced to the derivative properties, and students are only required to learn the basic operations, which do not involve rigorous mathematical reasoning and theoretical proof, and the description of the concept of knowledge points Knowledge is carried out through simple examples, and axiomatization and scientific definitions are not clear, leading to the inability to define random variables. Default students already have knowledge of these mathematical axioms, leading to obstacles in the interface with university learning content and affecting subsequent mathematics courses; therefore, enhancing the organic interface between university mathematics and high school mathematics is fraught with necessity.

2.5 Introduction of mathematical modeling and mathematical experiments

Mathematical modeling is the application of mathematical knowledge and mathematical methods to solve practical problems, which can effectively improve students' ability to analyze and end mathematical problems, motivate students to learn mathematics, and arouse students' interest in learning. Mathematical modeling and mathematical experiments are currently not given much attention by teachers, however, along with the progress of technology and the development of the times, various majors begin to have higher and higher requirements for learning mathematics, therefore, the introduction of mathematical experiments in the teaching of mathematics courses can help students better understand the ins and outs of mathematical knowledge and stimulate students' desire and enthusiasm to explore mathematical knowledge[3].

In conclusion, in the context of "double first-class" construction, university mathematics should be explored through the reform of mathematics teaching curriculum in order to play an effective role in the construction of "double first-class", which is a complex project that requires the curriculum teaching methods and teaching content to be constantly updated. This is a complex project, which needs to update the teaching methods and contents of the curriculum, and also needs to promote each other in many aspects to explore the curriculum reform in line with the development of mathematics, in order to achieve the purpose of building a "double first-class" university.

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