

Teaching Research and Practice of Mathematics Course

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Abstract: University mathematics has always been the basic course of most majors in colleges and universities because of its basic, quality and application characteristics. With the expansion of university enrollment in recent years and the further deepening of high school curriculum reform, as the new students first faced the reform of the university mathematics curriculum and curriculum system, they encountered unprecedented new problems and challenges. This paper briefly introduces the problems existing in the teaching of university mathematics courses, and puts forward some ideas for the reform and exploration of university mathematics courses. It is hoped to explore, improve and construct a more effective teaching system of college mathematics courses to improve the quality of teaching and talent training.

1. Introduction

University mathematics (including advanced mathematics, linear algebra, probability theory and mathematical statistics) has always been the basic course of most majors in colleges and universities because of its basic, quality and application characteristics. Through the study of this course, students not only systematically master some basic knowledge of mathematics, but also lay a solid foundation for further study of other courses. At the same time, they can improve students' innovative thinking ability, abstract thinking ability, logical reasoning ability, analytical problem and problem solving ability.

Traditional mathematics teaching lacks the general abstraction from specific phenomena to mathematics and applies general conclusions to the specific thinking training. It is easy for students to form rigid thinking habits and fixed thinking patterns. Teaching practice plays an important role in cultivating college students, hands-on ability, and innovation ability. However, traditional mathematics teaching only pays attention to the teaching of mathematics theory, and students lack practical exercises. Therefore, reforming the traditional simple knowledge transfer teaching mode is an important direction of current teaching reform^[1].

2. Problems in the teaching of university mathematics courses

2.1 Course problem

Mathematics is a conceptually abstract, logical course with a closed terminology and operational mechanism. The difficulty of setting the content of college mathematics courses is also increasing, which is one of the distinguishing features of mathematics and any other discipline. Its knowledge

structure has a strong systemic and continuous nature. The previous knowledge is not well learned and will definitely affect the learning of later knowledge. It is because of this feature that it is difficult to teach and difficult to learn^[2].

2.2 Teacher problem

Teachers are influenced by the teaching objectives, content, time and teaching methods of traditional subjects. Although some changes have been made in teaching concepts through learning and improvement, traditional teaching ideas are deeply rooted in the same way. The teaching of knowledge weakens the practical application of knowledge and skills. Some teachers pay attention to the dominant responsibility and ignore the main role of students. Regarding teaching as a one-way infusion process of "I tell you to listen", we pay attention to let students accept abstract conclusions, neglect the dynamic process of students participating in analysis and problem solving, pay attention to theoretical reasoning and deduction, and emphasize the theoretical system and knowledge of university mathematics curriculum. The intrinsic connection, using cumbersome mathematical theory to deduct, the student's mathematical foundation is inherently poor, causing students to be difficult to understand, not interested, tired of learning, afraid of learning, and finally do not learn^[3].

2.3 Method problem

Under the traditional education mode, teachers, students, teachers and students lack mutual communication and communication, and the learning atmosphere of mutual help is not strong. Learning is regarded as a "private matter". The academic performance of the course is mainly due to personal diligence and accumulation. It is related to the comprehension ability of the teacher's teaching. In addition, the teacher's teaching in the traditional teaching mode is the main way for students to acquire knowledge. Teachers often teach their knowledge according to their own thinking habits, and students are treated as listeners, making it difficult to achieve good results.

3. Suggestions on Teaching Reform of College Mathematics

3.1 Advocating inspirational teaching ideas

Inspired interactive teaching is an innovative teaching mode that combines quality improvement and ability training, compared with traditional infusion teaching ideas. Some schools have already carried out this kind of inquiry-based teaching method and achieved good results. Table 1 shows the statistics of the two classes of students in the school. Carrying out heuristic teaching can make teaching activities a process of inquiry learning. The essence is to ask students to ask questions, analyze problems, and discuss topics in order to help students master basic knowledge of mathematics and improve analytical application ability. In general, inquiry learning includes two aspects. On the one hand, students refer to the nature of mathematics, connect theory with practice, use mathematical thinking and methods to solve practical problems in real life. On the other hand, it refers to the study of inquiry-based questions conducted by students in the classroom. In the process of teaching, the teacher always takes the student-oriented teaching concept, highlights the student's main position in the classroom, fully exerts and mobilizes the students' enthusiasm and subjective initiative, allowing them to play freely and leave enough room for thinking.

Table 1 The effect of heuristic teaching reform

Group	Number of people	Test score
Test group	53	86.26±5.94
Control group	52	82.52±6.97
t		2.964
P		<0.004

3.2 Adjust teaching content and optimize course structure

With the progress and development of the times, it is necessary to enhance the modernization and applicability of the contents of the university's mathematics curriculum, change its "old, difficult, and overlapping" situation, and use the dynamic concept to view the connotation of the mathematical foundation. Inheriting the reasonable components of the traditional university mathematics content, selecting the classical mathematics knowledge as the basic content of the course, appropriately deleting some too old knowledge points and overlapping parts, increasing the introduction of modern mathematics and the viewpoint of modern mathematics and the content needed to adapt to the development of the information age. Grasping the main part of mathematics knowledge, paying attention to the application of modern information technology, highlighting the common law, and constructing a concise and scientific university mathematics knowledge structure that meets the requirements of the information age. In the process of setting up teaching content, it is necessary to change the situation of too much attention to book knowledge, emphasize its applicability and practicality, attach importance to social services, combine mathematical principles with social sciences, and connect theory with practice.

3.3 Optimize teaching methods and improve teaching results

Optimizing teaching methods and improving teaching results with the help of modern technology, optimizing the teaching environment and improving teaching quality and teaching efficiency, it is an important part of the reform of university mathematics teaching. Because multimedia has the advantages of intuitiveness, dynamics, and repeatability, it has a certain effect on auxiliary teaching. However, the abstraction and complexity of the mathematics curriculum, the use of multimedia will lack the interaction between teachers and students, the speed of teaching is not appropriate. Therefore, it is more appropriate to use traditional teaching methods, supplemented by multimedia and video teaching. Some concepts and definitions are relatively long. There are a large number of graphs in the integral that need to be summed by the segmentation method. A large number of determinants in the linear algebra need to be calculated. If the chalk board is used to waste time, and the image is not clear, it does not have much effect. If you use multimedia to demonstrate, it not only enhances the intuitiveness of mathematics teaching, but also stimulates students' enthusiasm for learning. In order to prevent students from not having enough time to think about it, for some more complicated reasoning and proof, the sidebar book explains, so that the two teaching methods can be combined organically, each with its own strengths and complementary advantages, in order to better serve modern teaching.

3.4 Integrate the mathematical modeling approach into the university mathematics curriculum

Mathematical modeling is not only the intersection of engineering, management science, economics and many other natural and social disciplines and mathematics, but also the intersection

of various mathematics branches. In the mathematics class, there is less interaction between the students and the instructors, and the students generally do not ask any questions about the teaching materials. This is a manifestation of the lack of independent thinking ability. The process of mathematical modeling is a process of creation and discovery. We can observe, analyze and explore a practical problem from multiple angles, adopt different mathematical methods and ideas, and establish a scientific and reasonable mathematical model. Innovative thinking is the soul and core of innovation ability, and it is also the most scientific way of thinking that students lack. Figure 1 is an excellent work in the Mathematical Modeling Competition. Through mathematical modeling, students can better grasp the ideas and methods of mathematics in practice, cultivate the spirit of innovation and scientific research, and improve their ability to solve practical problems. Study the shift of mathematics to applied mathematics. When this transformation is formed, students will be able to apply mathematics knowledge in the future of professional courses, and lay a good mathematical foundation for solving practical problems in their future work.

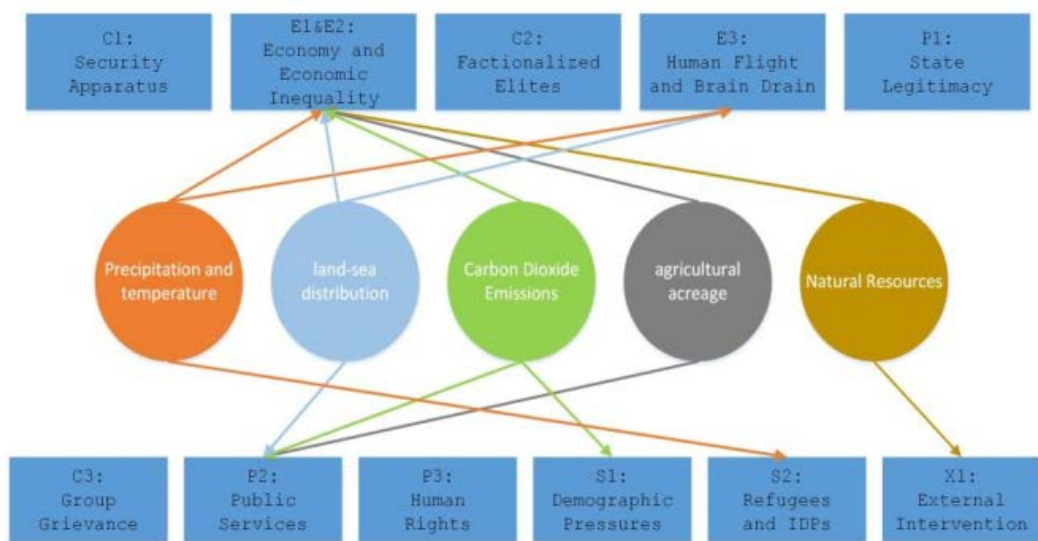


Figure 1 The relationship between climate change and indicators

4. Conclusions

In short, university mathematics education plays a very important role in university education. It not only teaches students basic knowledge, but more importantly, it can also comprehensively cultivate students' logical thinking ability, spatial imagination ability, computing ability and analytical ability and problem solving ability. In order to cultivate applied and innovative talents who attach importance to foundation, technology, ability and quality in the new era, university mathematics teaching should conform to the development of The Times and keep pace with The Times. Reform is not only necessary, but also necessary. It is necessary to focus on the study of teaching content, methods and means to improve students' interest in learning and to optimize the quality of teaching.

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