Research on the teaching mode of higher mathematics specialization in applied technology institution of higher learning

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Abstract: Applied undergraduate education is an education to cultivate advanced applied professionals with relevant knowledge, ability and comprehensive quality, facing the front line of production, construction, management and service. The thinking and scientific problem-solving ability required for cultivating talents is just what higher mathematics can give. In view of the problems existing in higher vocational mathematics teaching, such as serious disconnection from professional courses and low learning enthusiasm of students, this paper carries out the reform of higher vocational mathematics professional teaching: adjust the syllabus and teaching plan according to the professional needs and focusing on the cultivation of professional ability; Guided by major courses and actual work needs, closely combined with professional training objectives, integrate teaching contents; Change the teaching links in combination with the mathematical knowledge points in the professional courses; For abstract concepts, we should use modern teaching methods to strengthen intuitive and image teaching; For tedious calculation and data analysis, strengthen the application of mathematical software to reduce the amount of calculation. Specialized teaching is to improve students' learning enthusiasm and learning ability.

1. Introduction

Modern universities are closely related to social development, disciplines and specialties are the link of university clusters, and young people who are becoming mature in body and mind are the objects of university education. These are the main characteristics of universities. After the expansion of university enrollment, China's Ministry of Education issued a corresponding plan, which divided universities into two categories: technical skill type and academic type. Advanced mathematics is a basic required course for science and engineering majors and economics and management majors, and the teaching innovation of advanced mathematics is the top priority of all teaching innovations. Higher mathematics education is the foundation of the whole university education, and it is the learning tool of science and engineering and economics majors. Higher mathematics should effectively serve professional courses and realize the seamless connection between higher mathematics courses and professional courses. It is very important for students to acquire good mathematical ability and sustainable development ability through the study of advanced mathematics. Therefore, the teaching innovation of advanced mathematics is the most important of all teaching innovations. At the same time, effective teaching is an important way to achieve the goal of cultivating modern talents in applied technology universities. To implement effective teaching, we must lay emphasis on students' internal needs and development, change students' learning methods, and strengthen the systematicness and internal logic of problem-solving learning.

Global economic integration has prompted mankind to quickly enter the information age. Applied technology universities that cultivate applied talents are also facing new opportunities and challenges. How to explore, discover and use the effective teaching mode under the background of information technology to improve, promote and promote the quality of higher mathematics classroom teaching is an urgent problem to be studied. As an integral part of the University, applied undergraduate colleges are also affected by this law. Therefore, we should have a basic understanding of the functions and characteristics of the University, which is also the basis of curriculum development. The construction of instructional materials in Application-oriented Institution of higher learning is one of the important guarantees for the transformation from higher education to application-oriented. It is not only an important measure to deepen the teaching innovation of institution of higher learning, comprehensively improve the instructional quality and consolidate the employability of students, but also a specific action to promote the transformation of institution of higher learning from knowledge science and technology to application skills. "Higher mathematics" is one of the public basic courses. How to make students transition from theoretical calculation to practical application, "higher mathematics" textbook reform has formulated a feasible scheme. In order to ensure that "higher mathematics" can meet the needs of the continuous development of social talent training mode, the construction of applied "higher mathematics" has become an important topic in teaching innovation.

2. The existing problems and reform and innovation of higher mathematics teaching under the background of application transformation

2.1. Problems existing in higher mathematics under the background of application transformation

At present, most institution of higher learning generally choose the textbook of higher mathematics compiled by Tongji University, which is rich in content and comprehensive in knowledge points. However, the teaching content is rarely combined with professional characteristics, and the teaching content fails to reflect the similarities and differences of different majors. At the same time, the teaching of higher mathematics focuses on the "knowledge-driven" indoctrination teaching concept, with the elaboration, proof or deduction of definitions, theorems and algorithms as the main line, with teachers imparting theoretical knowledge points and students passively accepting knowledge as the main focus, attaching importance to the systematic teaching of teachers' theoretical knowledge points, while neglecting the cultivation of students' ability to integrate theory with practice and application, ignoring the training of students' practical ability and innovative spirit. This kind of "seeing the trees but not the forest" teaching makes it difficult for students to feel the role of higher mathematics in the follow-up professional courses. However, with the development of network science and technology, college students are basically inseparable from the impact of the Internet. At the same time, considering the characteristics of higher mathematics, such as strong logicality, high degree of theorization and abstraction, the traditional teacher-centered teaching mode has been unable to attract students' attention. In the whole teaching process, students can barely keep up with the teacher's thinking and participate in the classroom, but fail to participate in the classroom consciously. Especially, once they don't understand a certain link in the course of lectures or wander off slightly, they can't keep up with the teacher's thinking, which seriously impacts students' learning. The original curriculum system of higher mathematics can't fully meet the current educational requirements, so we must re-examine the teaching mode of higher mathematics and carry out effective reforms in the teaching content, teaching methods and assessment methods of higher mathematics.

2.2. Higher mathematics teaching innovation under the background of application transformation

The key of higher mathematics teaching innovation lies in teachers, who should consciously renew their ideas; Teachers should establish a sense of specialization, be familiar with the application background of mathematics in related majors through in-depth professional practice and communication with teachers of various professional courses, and have a strong ability to use mathematical theories and methods to solve practical problems in related majors; In the information age, students can acquire knowledge through various channels. We should change from "teaching to fish" to "teaching to fish", change the traditional teacher-centered "knowledge teaching" teaching mode, take students as the center, and improve students' autonomous learning ability through the initiation and guidance of students; Teachers should establish information awareness, be familiar with the use of various teaching software and multimedia technology, and create a network

environment for students' autonomous learning. Secondly, we should speed up the reform of higher mathematics instructional materials, take specialization as the starting point, take information acquisition, information expression and information processing as the core, and carefully consider the selection and structure arrangement of instructional materials; Focusing on the cultivation of mathematical application ability, with the help of information tools, the teaching content design adopts professional related problems and introduces case teaching as far as possible, integrates the idea of mathematical modeling, and strengthens the cultivation of scientific computing ability; Integrate information technology into traditional teaching, and gradually form a professional hierarchical higher mathematics teaching mode of "teacher guidance + students' Autonomous Learning + teachers and students' cooperative discussion". At the same time, we should reform the traditional teaching methods, adopt diversified teaching methods and problem driven teaching methods such as inquiry teaching, case teaching and project teaching, enrich teaching means, and establish a higher mathematics network teaching platform, so as to enable teachers and students to effectively complete the goal of Higher Mathematics in the reform of teaching mode.Figure 1 shows the existing problems and reform and innovation of higher mathematics teaching.



Figure 1 Existing problems and reform and innovation map of advanced mathematics teaching

3. The Significance and Countermeasures of the Specialization Construction of Higher Mathematics

3.1. The Significance of Specialization Construction of Higher Mathematics

To apply a certain knowledge technology to solve problems, we should first master its basic theory or principle, and then learn how to apply it and make good use of it. Because students of different majors need different basic knowledge of mathematics, in the process of imparting knowledge, we must take sufficient majors and moderate difficulty as the basic principles. Facing the students of different majors, the needs of basic mathematics knowledge in advanced mathematics classroom are obviously different. How to make the basic knowledge of mathematics go deep into professional services requires every teacher to lay emphasis on the professional background of the students he teaches. If necessary, he can hold teaching seminars with the teachers of specialized courses in order to master the needs of different majors for basic knowledge of mathematics. The undergraduate stage is a comprehensive quality education. Through the professional construction of higher mathematics teaching, the current situation of many teachers' "one lesson plan eats the whole world" can be changed. This kind of teaching innovation will greatly promote teachers to expand their knowledge in different ways, and actively practice in the teaching process to explore teaching modes suitable for students of different majors and levels. Through the reform of higher mathematics teaching, students can be liberated from complicated calculations, and the ability of initially establishing mathematical models and comprehensively

using mathematical knowledge and computer to solve mathematical models is emphasized. By making full use of modern educational technology, a large number of animations and graphics are made, which enhances the intuition of teaching and helps vocational college students to thoroughly understand and digest abstract mathematical knowledge. At the same time, rich network resources have been developed to build a platform for students' autonomous learning. Being able to exercise students' independent thinking ability and mutual cooperation ability is conducive to cultivating their comprehensive quality.

3.2. Countermeasures for Specialization Construction of Higher Mathematics

The content of higher mathematics curriculum is a system. In order to make students more effectively recognize the connection between knowledge, the curriculum content can be scientifically divided and effectively and timely integrated according to the logical relationship of the curriculum and learning cognitive experience. In the teaching process, teachers should flexibly use "case teaching method", "discussion and cooperation teaching method", "interactive teaching method", "task driven teaching method" and "problem-based teaching method" according to different teaching contents, lay emphasis on the interaction with students and avoid "monologue"; Make boring problems interesting, abstract problems intuitive, complex problems simple and theoretical practice, lay emphasis on teaching students the formation process of knowledge, summarize and summarize the contents of each chapter in time, and become the organizer, guide of students' learning. emergence and development of most and collaborator The Application-oriented Undergraduate Institution of higher learning are in a relatively weak position. Based on the characteristics of China's national conditions, we can try to unite institution of higher learning with the same background, development objectives and school running levels in our region to form alliances, establish cooperative institutions and establish a common development mechanism. At the same time, the teacher development community is an important way to build a team of teachers with high moral taste, deep professional attainments and strong scientific research ability. The establishment of a professional development community for teachers in undergraduate institution of higher learning will achieve twice the result with half the effort in rapidly improving teachers' moral level and teaching and scientific research ability. Through communication, communication, sharing and cooperation, each member can turn public knowledge into personal connotation with the help of individual and collective wisdom, so as to form interpersonal relationships that promote and influence each other, and finally realize the development and improvement of teachers. Figure 2 shows the construction of higher mathematics specialization.



Figure 2 The professional construction map of advanced mathematics

4. Conclusions

The planning and development of applied undergraduate education is the general trend of China's higher education development. When the scale expansion of popular higher education ends and it enters the connotation development stage of improving quality and enhancing benefits, applied undergraduate education will also enter the "ice-breaking" development stage. As the saying goes, "know yourself and know yourself, and you will win a hundred battles." At this stage, it is the premise of exploring the development path of applied undergraduate education in China to know our own current situation and shortcomings and learn from the advanced experience of foreign applied higher education development. In order to meet the needs of the country and society for applied and innovative talents, institution of higher learning should reform the traditional higher mathematics teaching mode to serve the specialty. Teachers should innovate the teaching idea of higher mathematics, so that students can improve their innovation ability and application ability through mathematics learning, and they can really meet the needs of social and economic development, scientific and technological progress and professional construction. Application-oriented "advanced mathematics" textbooks should set up the goal of student-oriented, imparting knowledge and cultivating ability, and cultivating talents in application-oriented universities; A series of practical problems, such as the reform of applied "advanced mathematics" textbook and the assessment system of applied talents, are studied and practiced.

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