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How to Improve the Teaching Efficiency of Higher Mathematics in Private Colleges

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Abstract: With the intensification of social competition and the rapid renewal of science and technology, the society urgently needs high-skilled application-oriented talents, and the cultivation of students' innovative thinking ability becomes more and more important. Advanced mathematics can cultivate students' abstract thinking, logical thinking and innovative thinking. Therefore, more and higher requirements are put forward for the teaching of advanced mathematics. This paper summarizes the present situation of private colleges and universities of higher mathematics teaching, from the several aspects of higher mathematics teaching, mainly put forward according to their aptitude, strengthen creative thinking training, pay attention to innovation practice, integrate into mathematical model, improve teachers' teaching ability, discusses methods to improve the efficiency of higher mathematics classroom teaching.

1. Introduction

The ability of innovative thinking is an inevitable requirement of the development of science and technology and economy. Innovative thinking means that people think about the connections between things in an unprecedented way and generate new insights [1-2]. The process of higher mathematics teaching is the process in which teachers guide students to carry out mathematical thinking activities. It is the process in which students are the main body under the guidance of teachers and through the active participation of students, internalization and absorption realize self-development [3]. Therefore, to improve the efficiency of classroom teaching, higher requirements for teachers, pressing for higher mathematics educators to try and explore teaching innovation.

As a basic subject with a long history, advanced mathematics education in our country in the long practice has accumulated rich experience, traditional mathematical education in the teaching concept, theorem, trains the student to the strict logical thinking and reasoning ability, certificate

and very good results have been achieved in such aspects as computing power, the talent of education at various levels and played a positive role [4]. With the rapid renewal of science and technology, the society urgently needs high-skilled application-oriented talents, but also put forward more and higher requirements to the teaching of advanced mathematics. Some disadvantages of the long-term fixed mathematical education model in colleges and universities in Our country are highlighted. For example, the teaching content emphasizes theory over application, leading to a serious disconnection between learning and application. In terms of teaching methods, students' subjective initiative can not be given full play, so it is difficult to improve their ability to analyze and solve practical problems and innovate. The teaching mode emphasizes unity over individuality, lacks hierarchy and diversification, and can not better meet the needs of different training objectives of different majors [5-6]. At present, there are many problems in mathematics teaching, which not only affect the enthusiasm of college students in higher mathematics and subsequent courses, but also affect the teaching effect of college mathematics classroom. More importantly, it is not conducive to the cultivation of innovative talents and makes it difficult for students to face the challenge of severe employment situation. Obviously, it is urgent to reform the education system to improve classroom teaching.

2. Problems Existing in Higher Mathematics Classroom Teaching

2.1. Object of Instruction

As a result of college expansion, the students generally weak mathematical foundation, because of the high school mathematics result is bad, a large part of students have no interest in higher mathematics learning, and there are fears that a class will have a headache, and won't listen, individual first-year students just want to give up learning of higher mathematics, think they don't learn math. However, advanced mathematics is the foundation of subsequent courses. To give up learning advanced mathematics means to give up professional learning.

2.2. Teaching Staff

Over the years, although the higher mathematics teaching workers have made many beneficial attempts to the higher mathematics reform, the teaching content and mode have not changed fundamentally. The outdated teaching contents and backward teaching methods cannot meet the teaching requirements of the development of various disciplines and the practice of engineering technology, which is mainly reflected in the invariable teaching content system and single teaching method, and the teaching is still carried out according to the traditional model. The mode of "theoretical teaching" and "indoctrination teaching" overemphasizes theoretical proof, which makes a large number of students tired of learning advanced mathematics.

2.3. Teaching Environment

As an important basic course for junior students, advanced mathematics is often taught in large classes, which inevitably leads to students' inability to concentrate on study. There are many students who read irrelevant books and even sleep in class. Therefore, the teaching effect is not good.

3. Measures to Improve the Efficiency of Higher Mathematics Classroom Teaching

3.1. Strengthen Classroom Teaching Effect, Improve Students' Interest in Higher Mathematics

Classroom teaching is the basic form and center of teaching activities, which consciously penetrates and highlights mathematical thoughts in every link of teaching. In order to enable students to acquire knowledge at the same time, but also learn the way to think about problems, improve the ability to analyze and solve mathematical problems, and cultivate students' spirit of innovation.

3.1.1. In View of the Problems that Students May Encounter In Classroom Learning, the Countermeasures Are Pointed Out

It is difficult for students to accept advanced mathematics completely because of its much content and little class time. If you don't understand something, you may give up and accept the previous ideas and conclusions, and continue to listen to the teacher's explanation. Make full use of the self-study time after class to make up for the missing part in class. Students should know why to study advanced mathematics, what to learn and how to learn it.

3.1.2. Focus on the Presentation of Knowledge in Class

The knowledge taught in class can be divided into three categories. First, the formula theorem students must accept and understand, and be able to skillfully use. Second, it is particularly important and not difficult to prove the proposition, to master the idea of proof. The third is to broaden the scope of knowledge, does not require a complete grasp and can use the knowledge.

3.1.3. Emphasis on Concept Teaching

Concept is the tool of thinking, all analysis, reasoning, imagination must be based on and use of concept. Concept teaching is an important content in higher mathematics teaching. For most students who just enter the university campus, they tend to pay more attention to the study of basic theories and ignore the basic concepts. This requires teachers to be good at using "heuristic" teaching methods to stimulate students' interest in learning and start their inner power of thinking.

3.1.4. Solve Puzzles to Stimulate Interest

Too difficult and too easy knowledge will make students dull of interest, thinking stagnation. Therefore, in teaching, teachers use refined language, strict logic can make the difficult easy, stimulate students' interest in class. Solve the problem by multiple solutions. Divergent teaching can broaden students' scope of knowledge and thinking, and improve their mathematical thinking ability.

3.2. Strengthen the Cultivation of Innovative Thinking

While cultivating students' thinking ability, teachers should strengthen the cultivation of creative thinking, because creative thinking is the core of creativity. The so-called "creative thinking" is to reorganize the existing knowledge and experience, put forward new breakthroughs, new discoveries. On the one hand, teachers should master the theoretical knowledge and methods of creative education, and learn about the principles of creation and master its principles, methods, skills and laws, know how to implement creative teaching. On the other hand, teachers must

establish a new view of teachers and students, construct a relationship of mutual respect, trust and understanding between the two subjects of teaching, and discover each individual's creative personality for students [7-8]. Only when teachers have high quality of innovation can they constantly show innovative tendency in teaching activities and daily communication, and only then can they stimulate students' innovative consciousness and firm students' innovative faith. Teachers should motivate students to reshuffle, migration, comprehensive use has acquired knowledge, searching for ways to various fantasy goals into reality, let the students understand the mathematical creative thinking skills in the learning process, and to promote their new skills, enhance their creation consciousness. At the same time, teachers should satisfy students' curiosity in teaching, so that they have a fresh sense of knowledge.

3.3. Teaching Students According to Their Aptitude

Teaching students according to their aptitude is a well-known teaching principle with a long history [9-10]. It is equivalent to what we often call "personalized teaching", which is difficult to implement. It requires teachers not only to have a certain understanding of the object of education, but also to exert their own wisdom and creativity, use certain teaching arts, and have enough love and patience. From the practical point of view, "teaching students according to their aptitude" can also be regarded as a kind of educational art to understand and explore.

3.3.1. Face up to Differences and Give Consideration to Students of all Levels

Teachers should be confident in the development of each student, and provide ideal teaching and appropriate learning conditions for each student, so that each student can get their own teaching. In teaching, in order to truly embody the principle of "teaching students in accordance with their aptitude", we should practice the concept of "student-oriented", face up to the differences among students, recognize and accept such differences. Based on the actual situation of students at different levels, different teaching objectives and requirements are put forward to maximize the learning potential of each student.

In teaching, teachers should pay attention to inspiration and induction, as far as possible to pay attention to all kinds of students, and try to make all of students have harvest. If a student can't keep up, slow down a bit. According to the objective situation that students differ greatly in mathematics, some colleges and universities have adopted the method of stratified teaching and differentiated treatment, which has produced certain effects. This kind of exploration and reform is beneficial and worthy of reference.

3.3.2. Teaching Closely Related To Students' Profession and Practical Life

Combining theory with practice is the secret of good teaching. "Teaching students according to their aptitude" is actually a concrete application of the principle of linking theory with practice. In higher mathematics teaching, if teachers can closely relate students' profession and life practice, profound and boring theoretical knowledge can often become easy to understand. Mathematic is a very special subject, it has both literary side, and the application side. Therefore, teachers in the classroom teaching process intersperse with some examples in life, can adjust the dull atmosphere of the classroom, and arouse students' interest in mathematics. In the teaching of higher mathematics, it is necessary to explain the relevant background knowledge and interesting things about mathematicians properly, so that the liberal arts students can understand that higher

mathematics is not so terrible as imagined, thus relieving their fear, overcoming anxiety, generating a new understanding of mathematics, and enhancing their confidence in learning. For example, when students majoring in computer learn advanced mathematics, teachers can combine the knowledge and information of computer to teach, so that students can find the original connection between mathematics and computer is so close that advanced mathematics can be integrated into the things they are familiar with and love. In fact, there is no mountain between mathematics and other subjects. There must be wonderful scenery at the intersection of different subjects.

3.3.3. Reform Teaching Method and form, Make Teaching Process Become Lively

Students are the main body of learning and teachers are the leading part of teaching. In actual teaching, we should pay attention to students' feelings and confusion, differences between students, communication and interaction between teachers and students, so as to create a good classroom atmosphere and ultimately improve the teaching effect. Higher mathematics teachers should change and innovate in teaching ideas and methods and pay attention to actual results. According to the actual situation of the students to stop properly, listen to the students, comment on what the students say. For example, students who can do exercises explain to the top of the platform, and other students can raise questions. In this way, we can see the lively scene of students discussing and arguing about math problems, as well as the enthusiasm of studying textbooks, inquiring materials and eager for teachers' help in order to seek correct solutions. Through teaching activities training students to dare to think, dare to speak, students fully experience the joy of success and try to meet the emotional needs of self-expression students, improve their interest in learning and confidence. Every time students ask questions, just like dropping a stone in the lake, splashing a piece of thinking spray, can help improve the quality and value of classroom teaching, make the classroom become more meaningful, more memorable.

3.4. Pay Attention to Innovative Practice, Incorporate the Idea of Mathematical Model

Guiding students to build mathematical models and conducting simple mathematical experiments with computer software tools in the teaching process are both innovative and practical activities. Mathematical modeling can effectively train students' mathematical theoretical knowledge and practical application ability, and is an important way to train high-level applied talents [11-12]. Therefore, the integration of mathematical modeling into higher mathematics classroom teaching can effectively cultivate students' ability to solve problems by using mathematical knowledge independently, stimulate students' enthusiasm in learning mathematics, and contribute to the construction of a higher level of teachers. This is an effective way to improve the efficiency of higher mathematics classroom teaching, and will certainly have a positive and far-reaching impact on the deepening reform of mathematics teaching and talent training.

3.4.1. Teaching Idea and Objective: To Integrate Mathematical Model into the Basic Courses of University Mathematics

The number of students participating in mathematical modeling contest is limited, and it is difficult to achieve good results only by short-term competition process. Therefore, only by integrating mathematical modeling into the basic courses of university mathematics can we effectively cultivate students' mathematical modeling ability and benefit more students. Of course, the integration of mathematical modeling thought is not to pursue the content of mathematical

modeling as a system, but to fully reflect the leading role of mathematical modeling thought when the existing curriculum system remains basically unchanged. On the one hand, the content of mathematical modeling should highlight mathematical ideas and methods and be easy to understand. On the other hand, we should constantly summarize and improve. It also adds vitality for the traditional mathematics teaching, attract students' interest in learning mathematics, and improve the learning effect.

3.4.2. Content and Method of Teaching: Combine Theory with Practice and Use Case Teaching Appropriately

Mathematical model can effectively blend in mathematics theory to solve practical problems, so in the teaching of higher mathematics, some new concepts difficult to understand, should be introduced with mathematical modeling thought. Presenting some actual cases stimulate the curiosity. Let the students fully realize that mathematics is not dull and difficult to approach, but the depiction of the colorful real world.

For example, the slope of the tangent line and the speed of variable speed linear motion are introduced in the derivative explanation. In addition, marginal analysis, elastic analysis, taxation and other practical problems are proposed as the application of derivatives. When teaching the extreme value and maximum value of functions, we can start from practical problems, list some optimization problems with the most economical materials, the largest profit and the smallest cost, and present them to students in mathematical modeling scenarios, and discuss in groups to seek solutions. Using the learned knowledge to establish mathematical models to explain practical problems in life, students not only learn knowledge, but also experience the process of exploring, discovering, creating and solving problems, which is an effective way to cultivate students' innovation ability and mathematical application ability.

3.4.3. Teaching Forms and Means: Add Mathematical Experiments, Make Full Use of Mathematical Software

The traditional teaching form of higher mathematics is mainly classroom teaching, which is monotonous and boring and has always been regarded as an abstract and profound course, which has virtually dampened the enthusiasm of students in learning. The other key step of mathematical modeling is to use computer to solve the model, and mathematical experiment is an important part of mathematical modeling. Bring this idea in Mathematics classroom, students do "mathematical experiments" according to their own assumptions, the teacher heuristically guide them to form concepts, discover rules, so as to change the passive acceptance into active discovery, strengthen the enthusiasm of students to learn.

3.5. Improve the Teaching Ability of Teachers

3.5.1. Grasp the Classroom and Show the Charm of Teaching

Classroom is a real stage for teachers to teach knowledge and show their teaching charm. How to grasp the classroom time, how to let the students really master the knowledge, how to infect the students with their own teaching charm, are worthy of serious consideration by the teachers of advanced mathematics. Therefore, the teacher should prepare the lesson carefully, for the complex content, should consider how to use language easy to understand. In class, let students clear learning objectives, knowledge context. The study method is imperceptibly infiltrated in the teaching

process. In addition, highlight the key points, encourage students, as far as possible to let most students keep up with their own ideas. Communicate more with students during the break, learn more about students' listening, and cultivate a good relationship between teachers and students.

3.5.2. Adjust the Teaching Content with the Specialty Characteristics of Colleges and Universities

On the basis of the teaching syllabus, teachers should combine the characteristics of colleges and specialty disciplines to make appropriate adjustments of higher mathematics teaching, introduce mathematical knowledge with practical problems of each discipline, so as to carry on inquiry learning. It not only requires conduct more teaching research among teachers of advanced mathematics themselves, but also communicating with teachers of various disciplines to understand the application of advanced mathematics in the follow-up courses, so as to pay attention to some emphasis in the teaching process.

3.5.3. Carry out a Variety of Extracurricular Academic Activities Based on Mathematics Teaching

Guide students to participate in some extra-curricular scientific and technological innovation activities, such as mathematical modeling competition for college students, and use the mathematical knowledge learned to solve practical problems. In the process of solving problems, students can not only experience the joy of solving practical problems with book knowledge, but also stimulate their interest in higher mathematics learning.

3.6. Multimedia Technology Combined with Traditional Teaching

For advanced mathematics course, it is not easy to combine multimedia teaching with traditional teaching. On the one hand, because of the strong logical thinking ability of advanced mathematics courses, excessive use of multimedia teaching may lead to the problem, that students can’t keep up with the teacher's lecture content. So blackboard teaching is still essential at the present stage. On the other hand, with the development of The Times, the use of multimedia teaching is the general trend. Such as mathematics graphics, blackboard teaching is far from multimedia teaching intuitive and easy to understand. To sum up, how to reasonably allocate the proportion of media teaching and traditional teaching is particularly important for higher mathematics teaching.

Higher mathematics requires strict logical reasoning and tedious calculus. Chalk, blackboard and language are the main carriers of teaching. Teachers can use multimedia information technology creative reform of the teaching activities and design, intuitive show abstract things, simulate the dynamic process, make the performance of the teaching content and form more visual. So that mathematics classroom teaching received twice the result with half the effort. It is helpful for students to explore, and cultivate their innovation ability.

4. Conclusions

In short, only by deeply understanding the goal of talent training and accurately grasping the teaching concept of higher mathematics in private colleges, can the quality of talent training be truly improved. As a teacher, we should continue to carry out teaching research and exploration. Teaching innovation is inseparable from the classroom, students and teaching practice, we must constantly sum up experience and learn new teaching methods in practice. Finally improve the

classroom teaching effect. This topic plays an important role in the development of the whole field of mathematics, and is an effective way to deepen the reform of higher mathematics teaching. We will continue to increase the strength of the reform and exploration, so that higher mathematics can better serve higher education and lay a solid foundation for cultivating more and more excellent high-skilled application-oriented talents.

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