

Ways to Improve the Learning Ability of Higher Applied Mathematics

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Abstract: With the advent of the “Internet plus” era, information technology change rapidly. The cultivation and improvement of students’ mathematical ability is the key influencing factor of technological innovation. Therefore, under the changing needs of higher mathematics teaching, we should lay a foundation for the development of students’ Vocational and application ability, and improve students’ innovative ability. Combined with the current situation of higher mathematics teaching, this paper analyzes the cultivation of students’ application ability in higher mathematics teaching.

1. Introduction

Higher mathematics has strong abstraction and logic. As an important course, it mainly comes from reality and is applied to reality. The content of higher mathematics education system is closely related to real life. Therefore, the application of mathematics should be considered in teaching. However, in practical teaching, many colleges and universities ignore the application of higher mathematics courses, which affects the cultivation of higher talents. Under the background of the development of quality education, we should innovate the teaching concept of higher mathematics, take students as the basis, and pay attention to strengthening the cultivation of the application ability of higher mathematics curriculum.

2. Reflections on the Current situation of Higher Mathematics Teaching in Colleges and Universities

Influenced by traditional education, higher mathematics in colleges and universities pays more attention to the teaching of book knowledge, resulting in students’ learning mechanization, less classroom activities and lack of interest in classroom learning content. Therefore, colleges and universities should recognize the importance of higher mathematics teaching reform, integrate practice into teaching and integrate theory with practice (Shi Yue, 2020). In practice, teachers should improve their interest in mathematics teaching and teach students to apply what they have learned.

In addition, colleges and universities should also pay attention to cultivating students’ ability to think and apply existing mathematical knowledge. Colleges and universities should not blindly require students to learn basic mathematical knowledge, but should require students to strengthen the mastery of basic mathematical knowledge in practice, so that students can deepen their understanding of mathematical knowledge through practice. In the process of learning, students should not only question and innovate the existing mathematical knowledge, but also improve their ability to solve new problems.

3. Problems of College Students in Learning Advanced Mathematics

3.1. Curriculum perspective

Higher mathematics curriculum puts forward higher requirements for students’ knowledge content, knowledge system, abstraction and preciseness, and does not have the characteristics of primary mathematics system. The difficulty of higher mathematics knowledge is not only reflected in the abstraction of knowledge itself, but also in the strengthening of the logical connection between knowledge. The strict reasoning between knowledge is more complex. From primary

school mathematics to higher mathematics, mathematics is no longer closely related to students' actual life. Advanced mathematics is based on logical reasoning. Higher mathematics requires students to have strong logical reasoning ability, abstract thinking ability and imagination.

3.2. Teacher's perspective

The survey results show that the classroom teaching effect of higher mathematics is also an important guarantee for students to learn higher mathematics well. Higher mathematics teachers do not understand the characteristics of college students in the new era and can not change the teaching methods and forms in time to meet the needs of college students for higher mathematics courses in the new era.

First, there is a lack of psychological analysis between teachers and students. Students failed to analyze and summarize the characteristics of higher mathematics and adjust their learning psychology in time.

Second, teachers pay more attention to the indoctrination of knowledge rather than the transmission of knowledge, ignoring the teaching of knowledge solutions.

Third, teachers' teaching methods can not adapt to the characteristics of social development in the new era. They do not conform to the characteristics of social informatization, have no effective connection with science and technology, and do not adopt more flexible and novel teaching tools and means.

Fourth, teachers do not pay attention to students' classroom participation, only pay attention to self-expression, ignore students' feelings, lack of interaction with students, and turn two-way classroom teaching into one-way classroom communication. In this way, it frustrates students' learning enthusiasm and brings difficulties to higher mathematics learning.

4. Methods of Improving Learning Ability of Higher Mathematics

4.1. Shortening students' adaptation cycle

The changes of the times affect the psychological needs of students. For students, learning and life have a period of psychological adaptation. Teachers should analyze the characteristics of psychological adaptation period, let students adapt to the life rhythm of college students in the shortest time and to the greatest extent, change from the rhythm of high school as soon as possible, and complete the role transformation in time. The change of psychological adaptation period affects students' future learning effect, which must be paid enough attention. In order to make students complete the transition of psychological adaptation period as soon as possible, it is necessary to analyze the characteristics of students' psychological adaptation period. For those who have just entered college, the life and environment they face in the short term are brand new. The new living and learning environment will make freshmen feel strange and novel. Among them, many freshmen who do not adjust their way of thinking in time can not quickly adapt to the study and life of the University. Lead to students' psychological difficulties(Wei Bangyou,2021). Ideologically, it is easy to produce obvious emotional fluctuations, which is bound to have a serious impact on learning. Therefore, teachers should give more care and help in life and give more guidance in time in learning. You can't accumulate problems, which is very important for subsequent learning.

4.2. Students' subjective initiative is not good

Tolstoy once said, "what is needed for successful teaching is not coercion, but to stimulate students' interest". Interest is a person's best mentor. Interest is also the psychological tendency of students to contact, understand, familiarize and apply knowledge. Therefore, teachers should let students establish their interest in learning higher mathematics as soon as possible. Only when students are interested in learning higher mathematics can they actively contact and fall in love with higher mathematics. In this way, students can complete the study of Higher Mathematics with a relaxed, happy, effective and positive attitude in the future study of higher mathematics. As shown in Figure 1:



Figure 1 Students participate in class problem solving.

4.3. Paying attention to students' applied thinking

Paying attention to students' applied thinking is based on ability, and paying attention to the most basic and realistic thinking necessary for higher vocational students to master and apply mathematical knowledge. First, pay attention to the interpretation of variables and formulas in application problems, pay attention to the expression and communication of mathematical language, and improve students' reading comprehension ability.

Application questions usually have long written narration, unfamiliar background and extensive knowledge. Reading and understanding the meaning of problems has become the first obstacle to solving application problems. First of all, we should improve students' perception of data and materials, as well as their ability to master the form and structure of problems. Second, improve students' reading comprehension ability. In the specific operation, the teacher can first guide the students to read the questions patiently and carefully, and mark the keywords and data when encountering long sentences; We must clarify the meaning of each noun and concept, analyze the mathematical meaning of each known condition and conclusion, and deeply explore the potential constraints of practical problems. We should simplify the problems and translate sentences with accurate mathematical language to make the subject concise and clear.

4.4. Creating situation and activating classroom

College mathematics classroom teaching must be student-centered and pay attention to the relationship between students' level and ability requirements. By creating professional situations and activating classroom teaching, we can achieve the purpose of cultivating students' application ability. According to the discipline characteristics of higher mathematics and the experimental and training conditions of our university, make full use of modern educational technology and teaching means to study and make higher mathematics teaching courseware. The courseware shows students the problem background of application problems through network links, and uses videos, pictures, curves or color art fonts to make abstract and boring mathematical symbols vivid; The courseware adopts computer graphics technology and simulation technology to display graphics that are difficult to be expressed orally or in writing, such as angle diagram, projection diagram, dynamic diagram and boring graphics in the form of multimedia, so as to achieve twice the result with half the effort(As shown in Figure 2); Courseware enriches the teaching content and greatly increases the amount of information; Diversified and multi-channel teaching methods make abstract

mathematical concepts and internal mathematical ideas easier for students to understand and accept. Courseware makes the teaching process from boring to vivid, from boring to vivid, changes the previous “cramming” teaching mode, plays a positive role in promoting students’ ideological transformation, and can better stimulate students’ enthusiasm in learning higher mathematics.

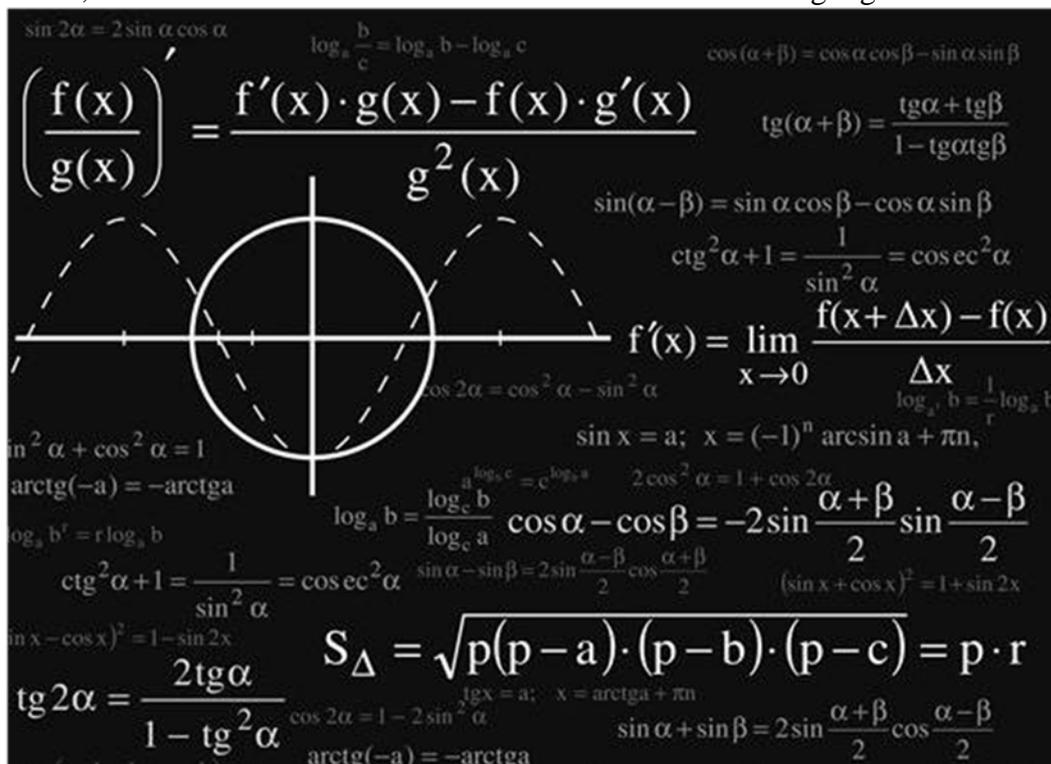


Figure 2 Mathematical drawing.

4.5. Carrying out mathematical modeling activities to improve students' mathematical application ability

Select experience and background materials suitable for mathematical modeling. In mathematical modeling, problem is the key. In teaching, teachers can introduce open or exploratory examples close to the actual production, life and other disciplines as the actual background to guide students to use the learned mathematical model in the process of mathematical modeling to find strategies to solve problems. Guide students to participate in social practice and experience the relationship between mathematics and life reality. For example, in the teaching of function content, students can be encouraged to discover and collect the situation and examples of piecewise functions by themselves; When learning the correlation of variables in statistics, guide students how to fit the curve with regression analysis; Using the textbook of educational savings to learn and apply the knowledge of number series and number series; Wait for students to experience the value and role of mathematics in solving practical problems, experience the process of comprehensively using knowledge and methods to solve practical problems, and infiltrate the concept of applying mathematics to practice.

Establish a mathematical model and abstract the actual problem into a mathematical problem. Extracting mathematical model from practical problems is the key of mathematical application. This requires teachers to guide students to actively describe and understand practical problems from the perspective of mathematics, and use mathematical language, knowledge and thinking methods to transform practical problems into mathematical problems. Students need to have certain reading comprehension ability and certain practical life experience. Therefore, teachers should guide students to actively read the problems closely related to real life in textbooks. At the same time, guide students to read more extracurricular books, participate in practice, and understand the application of mathematics in production, life and science and technology.

Learn to test results with practical problems. Mathematical modeling is the process of using

mathematical ideas, methods and knowledge to solve practical problems. The obtained solution must conform to the objective reality and play a guiding role in practical application. Different modeling methods often lead to different results. Therefore, we need to test the model, which is an important part of mathematical modeling. The test standard is objective reality. The conclusion drawn from the established model is only effective if it conforms to the reality, and the conclusion that does not conform to the reality must be abandoned.

Involve students in mathematical modeling. For those who are willing to participate in scientific research, there is no need to worry about the availability of students' research results, but should provide and create opportunities for students as much as possible in accordance with the principle of improving students' ability. In addition to promoting the communication between teachers and students, students can also improve their applied mathematics ability in scientific research practice. The purpose of learning is application. If students can apply the knowledge learned in the classroom to solve practical problems, innovate and develop, this is the result that every educator is happy to see.

6. Conclusion

To sum up, in higher mathematics teaching, we should combine students' professional reality and students' development characteristics, pay attention to innovative teaching concepts, adopt new teaching methods, improve students' mathematical literacy, guide students to learn to use their knowledge to solve practical problems, and constantly improve students' mathematical application ability.

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