

Teaching Strategy of Higher Mathematics Based on the Training of Mathematical Modeling Ability

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Abstract: Advanced mathematics is an important basic course of science and engineering. It mainly introduces the basic theories and methods of mathematics and trains students' thinking. Abstraction is its most basic and significant feature. Mathematical modeling is an important means to solve practical problems with mathematical tools. This paper attempts to take "mathematical modeling" as a breakthrough, so it is particularly important to improve the teaching strategy of advanced mathematics based on mathematical modeling methods in higher mathematics teaching. Based on this, this paper simply discusses the teaching strategy of advanced mathematics under the background of mathematical modeling method.

Keywords: Teaching strategy; higher mathematics; mathematical modeling ability

1. INTRODUCTION

Advanced mathematics is a subject offered in the university classroom. It is not difficult to see from the name that higher mathematics knowledge is highly targeted and covers a wide range of contents. Compared with previous mathematical knowledge, higher mathematics requires higher personal quality of students. This is of great help to the improvement of students' ability. Therefore, higher mathematics is set up in university courses to improve students' personal abilities.

Mathematical modeling is to transform the actual problem into a mathematical problem through analysis and simplification, and then use appropriate mathematical methods to solve it. The key step is to transform the problem into a mathematical model. In short, mathematical model is to use mathematical methods and means to make the most reasonable design and scheme for a practical problem. Now, combined with my own teaching experience, I would like to talk about the role of mathematical modeling in higher mathematics teaching. In the teaching of higher mathematics with the idea of mathematical modeling, the following processes are mainly used: first, express the mathematical problem, then solve it with appropriate methods, explain it with relevant theoretical knowledge, and finally verify the problem. In the teaching process of higher mathematics, it is important to apply mathematical modeling ideas in the following aspects:

(1) The mathematical knowledge in the textbook is restored by using the objects in real life, so that students can establish the idea that mathematical knowledge comes from real life.

(2) The idea of mathematical modeling requires students to simplify the information, data, or phenomena of specific objects in real life, translate and summarize abstract mathematical objects, and express the quantitative relationship in the solved mathematical problems in the form of mathematical relations, mathematical graphics or mathematical tables by using corresponding mathematical

tools and mathematical languages. This way is conducive to training Exercise students' mathematical expression ability.

Modeling cycle (Blum&Leiss, 2007) is shown in Figure1.

2. THE PROPOSED METHODOLOGY

2.1 The Practice and Further Thinking of Modern Flipped Classroom Teaching Mode

At present, some students are afraid of learning mathematics and have a fear mentality; Some students think that mathematics represents a degree and an exam, which is of little practical use. Teachers of higher mathematics must correct students' wrong ideas, start from the source of mathematics and the solution of practical problems, guide students to learn and apply mathematical modeling methods, because students can experience the scientific category of mathematics in the process of modeling, thus forming an effective method to solve problems

First of all, we should guide students to comprehensively learn mathematical background and knowledge content, deepen their ability to understand mathematical problems, broaden their mathematical knowledge, and lay a foundation for improving their mathematical level. Secondly, in the learning of mathematical modeling, we should pay attention to the cultivation of students' mathematical application ability and consciousness. Learn mathematical models, participate in the process of mathematical modeling, enhance the significance of students' mathematical application, and comprehensively improve students' ability to apply mathematical knowledge to solve practical problems. For students, the main purpose of learning mathematical knowledge is to train their way of thinking. Mathematical knowledge belongs to science knowledge.

Teachers should cultivate students' thinking ability so that students can look for solutions carefully and patiently when facing mathematical problems.

This kind of exercise can help students keep a normal attitude when facing various problems in life. Many students do not know how to use mathematics after learning it for a period of time. In the eyes of many students, mathematical knowledge is just doing problems. In fact, the college mathematics curriculum contains a large number of examples of mathematical modeling, which are derived from our actual life and are easy for students to understand and accept.

Therefore, as a teacher playing a leading role in teaching activities, when explaining higher mathematics, teachers should build relevant mathematical models for the chapters that can introduce mathematical models, put forward corresponding problems, and analyze and deal with them. On this basis, the assumption is put forward to improve the mathematical model.

2.2 The University Students' Career Education

Teachers integrate the modeling consciousness into the teaching of higher mathematics, so that students can imperceptibly feel the effect of the application of modeling ideas in higher mathematics teaching. This is conducive to improving students' ability to use mathematical knowledge and learning interest. In higher mathematics teaching, in order to consolidate and deepen classroom teaching knowledge and improve students' ability to master and apply mathematical modeling, we must attach importance to the practical teaching link, which plays a very important role in classroom teaching.

(1) After the teaching of mathematical knowledge theorem is completed, the teacher can appropriately arrange some training questions to exercise the students' ability to apply knowledge. They will not be loved and respected by students. Therefore, the classroom is always composed of students and teachers.

(2) Teachers should not rely on their own experience and ignore students' ideas to blindly carry out classroom teaching. The actual situation shows that this method is not feasible.

Only by paying attention to the cultivation of students' learning ability can teachers truly benefit students for life. This requires teachers not to suppress students' inspiration and ideas in the teaching process. Another example is the application of ordinary differential equations in life. An interesting little problem -- the hungry wolf chasing the rabbit: there is a rabbit, a wolf, and the rabbit is 100 meters west of the wolf. Suppose the rabbit and the wolf find each other and run together at the same time, the rabbit runs to the cave 60 meters north, and the wolf chases the rabbit along the rabbit's route, and assumes that the speed of the wolf and the rabbit is uniform. The application of mathematical modeling in the teaching of differential equations can effectively solve practical problems. The mathematical model constructed by differential equations does not have universal rules.

3. CONCLUSION

In a word, the cultivation of students' mathematical modeling ability in higher mathematics can effectively stimulate students' interest in learning, improve their ability to analyze and solve problems, and improve their ability to use mathematical knowledge. Applying the modeling idea to the teaching of higher mathematics is conducive to students' in-depth understanding of the knowledge of advanced

mathematics, reducing the difficulty of learning advanced mathematics, and improving students' ability to apply and explore knowledge. At this stage, there are still some problems in the introduction of modeling ideas in advanced mathematics teaching. Therefore, advanced mathematics teachers should conduct in-depth research and exploration, strengthen teacher-student interaction, and lay a good foundation for improving the quality of advanced mathematics teaching.

4. REFERENCES

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