The Application of Mathematical Experiment in the Teaching of College Mathematics

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Abstract: Mathematical experiment is an interesting course, requiring computer and mathematical logic. It focuses on the practice and thinking of college students, so as to increase its interestingness and students' enthusiasm for learning. College students will be faced with a large number of calculations, however, by virtue of mathematical experiment, mathematical model can be built through computer technology, and students can get rid of complex and boring mathematical calculations. The combination of teaching and computer technology can make it easier for students to learn college mathematics and reduce their calculation pressure, at the same time, students will prefer the course of college mathematics.

1. Introduction

College mathematics is a general compulsory course for each college students. In colleges and universities, through mathematical experiment, students can carry out corresponding experiments with mathematical software by virtue of computer, solve complex calculations and analyze more problems. It is conductive to the learning of professional courses. Under the guidance of teachings, students can establish mathematical model in mathematical experiment, enhance their ability to solve practical problems in professional courses and strengthen their innovative thinking ability. Mathematical experiment is the basis for college mathematics.

2. The Significance of Mathematical Experiment in College Mathematics

2.1 To stimulate students' interests in learning and learning methods

Mathematical experiment can mobilize students' interests in learning and their enthusiasm. Most people hold that college mathematics is abstract, so it is confusing to apply mathematics in practice. This is why more time and energy need to be put into memorizing and applying formula. Most college mathematical courses require the encouragement of teachers and students. Students can accept passive thoughts to learn the entire process. The introduction of college mathematics into experiment can transform mathematical knowledge into method of solving problems. Students can make use of mathematical experience to solve practical problems, and their interests and enthusiasm for mathematics continue to grow. Mathematical experiment can train and enhance students' skills of applying mathematics and innovative spirits. For a long time, Chinese students are impacted by traditional exam-oriented education, showing the characteristic of "high score and poor ability". The mathematical experiment can effectively integrate college mathematics and practical application, and perform a series of observation, exploration, conjecture and research. It can propose new ideas and methods and develop into ability, and can verify, practice and enhance students' ability to analyze and solve problems. Mathematical experiment can enhance students' ability of mathematical theory. Some students think that higher mathematics and linear algebra are difficult, so they cannot understand or grasp those knowledge. Mathematical experiment can be applied into college mathematics, by showing mathematical knowledge through dynamic presentation, so that students can better understand these knowledge points, disclose the connotations of each concept and create function image and specific abstract mathematical knowledge, to acquire knowledge and deeper emotions.

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2.2 Notes to mathematical experiment

Mathematical experiment is based on computer software, so the appropriate selection of experimental software is important. It should be suitable for students, so it is necessary to select different software according to the contents of mathematical education and students' characteristics. In traditional mathematical experiment, teachers cannot play their dominant role in simple tests. Whereas, students shall give fully play to their role, develop positive attitude and enhance their ability of solving problems. In fact, students can understand the values of mathematical experiment and enhance their interests in learning. At present, the relevance between mathematic books and mathematical experiment is low, thus, teachers shall transform their teaching method, theoretical knowledge, experimental contents and learning contents. In a word, mathematical experiment can be applied to solve practical problems in mathematics, enhancing students' practical skills while integrating knowledge.

3. The Application of Mathematical Experiment in College Mathematics

3.1 The history of mathematical experiment

Mathematical experiment exists from the last century, however, it was not mature enough because there was not assistance from computer. Nowadays, by virtue of computer application, mathematical calculation is less difficult. Without mathematical experiment, learning mathematics is complicated and complex calculations will decrease students' initiative for learning. Contemporary college students like new things, feel curious about new things and want to study new things. In this way, the implementation of mathematical experiment in colleges and universities can encourage students to learn well mathematics and have more time to study problems, which is helpful.

3.2 The importance of mathematical experiment

Mathematical experiment is important, and students can be better involved in learning mathematics. Mathematics is an important subject, assisting other subjects. If it is carried out in teaching, students will like to study mathematics and want to study it. Each college and university pays attention to mathematics, and the combination of mathematical experiment, which can integrate mathematical formula and experiment. In this way, teachers will have less pressure and students also can have less pressure in learning. In short, mathematical experiment is important for the teaching of college mathematics. It can enhance students' innovative ability, enrich their mathematical knowledge, combine mathematical formula with mathematical experiment, and save their time for more calculations.

3.3 The assistance for students from mathematical experiment

Teaching software for mathematical experiment is simple, and teaching will become easier. In accordance with procedures introduced by teachers, the results of calculation can be rapidly obtained. It can help students to determine their clear thoughts and solve calculations rapidly. It is applied into various mathematical subjects to save time and obtain accurate calculation results, also alleviate their burden. It is still in development, whereas, it will become more simplified and convenient. Students will be interested in mathematics, laying a solid foundation for other subjects, so that they will not feel troublesome to learn other subjects. Mathematical experiment is all about formulas they learnt and arrangement of knowledge, so students can master more methods and conclusions of mathematical experiment. It can promote students' new viewpoints and new concepts, solve problems, design solution scheme and analyze ways of solving problems. It can be seen that mathematical experiment is the best way for students to find out solutions.

4. The Effect of Applying Mathematical Experiment in College Mathematics

Along with the rapid development of computer technology, many teaching contents can be

completed in computer. For instance, mathematical reasoning, calculation and functional image can be directly seen in computer, and complicated three-dimensional images become easier to understand. It can transform traditional mathematical teaching method and develop new methods to learn and apply mathematics. Besides, it can reflect mathematical problems, such as space analytic geometry, abstract mathematical problems and re-integrating the selection of region. Due to the popularization of computer, students can complete relevant experiments independently and realize innovations in ways of learning.

4.1 The integration of mathematical experiment and college mathematics

When learning college mathematics, there are many problems. For example, if the calculation is not accurate, the whole question will not be solved correctly, which wastes time and results in students' dislike of mathematics. The integration of mathematical experiment can solve difficult problems in computer, and students can spend their time on something more meaningful. It can widen students' thinking ability and reach better effects. It can transform traditional teaching method, improve students' ability of solving difficult problems, and enrich the teaching. At the same time, teachers shall keep a clear mind and solve problems for students, make it simple and easy, save time for experiment and analyze solution steps. Students can learn the construction of basic mathematical figure in mathematical experiment, create mathematical model, master more mathematical formulas, carry out mathematical analysis and understand ways of solving problems.

4.2 It is conductive to selecting the contents of mathematical experiment.

There are two independent experimental courses and majors for extensive experiment and basic mathematical education, so it is necessary to pay attention to the difference between them. For instance, in independent mathematical experiment, the content is more practical, aiming to solving mathematical problems. In contrast, basic mathematical education shall be designed in accordance with the content of mathematical education. In addition, when designing mathematical experiment, it is required to adhere to the principle of professionalism, connection, novelty, methodology and middle difficulty. This method is related to actual GPS, such as the analysis on experimental data of road position. The selection and design of mathematical experiment shall be combined with mathematical theories, as well as practical mathematical problems.

4.3 It can improve students' thinking of learning mathematics.

In this process, students can learn to analyze the ways of solving the problem, build mathematical model by applying theoretical knowledge and master the laws. They can compare the results of many times of experiments and judge by themselves, which can better improve their thinking of learning mathematics. Colleges and universities all emphasize students' innovative ability and thinking ability. In mathematical experiment, students can rapidly reach the solutions by simple operation, which can strengthen their thinking ability and train their mathematical thinking ability. In order to apply mathematical experiment into college mathematics, teachers shall focus on cultivating students' practical ability to solve mathematical problems. At the same time, they shall actively develop computer application, and pay attention to the development of students' ability to apply mathematics to train their innovative ability. The diversified application of mathematical modeling can enhance the relationship between mathematical applications. When students carry out mathematical experiments, teachers can gradually deepen students' understanding of mathematical application and inspire their interests in learning mathematics. Fundamentally, students can enhance their deductive and logic thinking ability and make use of abstract and accurate visualized tools. Drawing and calculations can be easily completed on visual mathematical software and complex and difficult problems can be effectively solved. In traditional education, many students have high scores but poor operational and practical abilities. Whereas, mathematical experiment course can improve this big problem, training students' thinking and operational ability. Different from traditional education, students like studying more and develop more fun and logic elements. It can transform abstract problems into simple image problems, easier for students to understand and memorize solidly. Students can find out the difference in mathematical formulas and solve complex

problems through traditional teaching, to develop stronger mathematical logic and learning ability.

4.4 Practice mathematical experiment more.

Students are required to practice mathematical experiment more to memorize formulas and ways of solving problems, experience the fun in experiment to enhance their operational ability, inspire their interests in learning mathematics and develop stronger ability to solve problems. Because the results of mathematical experiments are unknown, students can propose questions to teachers in experiment, and teachers shall clearly solve their problems, analyze difficult points and solve problems step by step. Teachers are the guiding light for students and lead students to practice more difficult problems, so that students can solve those easier. Teachers shall guide students into correct path with their own methods, develop students' ability of applied computer questions, make full use of students' enthusiasm for courses related to computer, and transform mathematical knowledge, formula and model into simple knowledge, so that students can experience the magic of learning mathematics. The contents selected by teachers are also important. If selected contents are not interesting, students' practical ability cannot be mobilized and they cannot practice more, thus, it is meaningless to carry out mathematical experiment. Whereas, teachers shall encourage students to solve more interesting exercises to develop their experimental and operational ability. Teachers explain mathematical experiment in vivid language and students can actively carry out experiment, explore ways of solving problems and have deeper understanding and memory of conclusions they obtained. Students shall conduct experiment of analysis explained by teachers in class to consolidate their memories. Teachers also can give classroom to students and invite them to explain problems, so that students can solidly grasp knowledge and practice well mathematical experiment.

5. Conclusion

In summary, mathematical experiment is important in the teaching of college mathematics. It is necessary to combine mathematical experiment and college mathematics, by virtue of computer, and train students to analyze mathematics and solve complex calculations, further to like mathematics. In mathematical experiment, students can find out new problems, analyze mathematics with experimental results, enjoy the mathematics and inspire their enthusiasm for mathematics. At present, mathematical experiment is indispensable in college mathematics, which will bring different experience to mathematics.

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