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An analysis of effective ways to integrate the history of mathematics into higher mathematics teaching

Zongguo Zhang[1], Haijing Zhu[1], Xinli Dai[1], Cunrong Wang[1]

[1]*School of Mathematics and Statistics, Qilu University of Technology (Shandong Academy of Sciences), Jinan, 250353, P.R. China*

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Abstract: In the teaching process of basic subjects at the university stage, the most important subject is advanced mathematics. If students learn advanced mathematics well, then in the learning of some professional courses, the learning pressure and learning difficulty will be relatively reduced a lot, not only that, teachers' teaching quality and teaching methods play a vital role in improving students' comprehensive ability and future long-term development. Traditional advanced mathematics classroom teaching is relatively boring, so it is difficult for students to arouse interest in this difficult subject, and teachers need to improve teaching methods.

1. Introduction

It is not a very novel teaching method to fully integrate the history of mathematics into the subject of advanced mathematics. However, the teacher's teaching of the history of mathematics in the classroom can well mobilize the students' learning atmosphere and learning in the classroom. At the same time, teachers also need to innovate teaching models, so that the history of mathematics can be more flexibly integrated into the advanced mathematics classroom. In the classroom, teachers also need to introduce classroom content from the shallower to the deeper, so that students can better grasp the important and difficult points of advanced mathematics. This paper mainly analyzes the effective ways to integrate the history of mathematics into higher mathematics teaching.

2. The Integration of Mathematics History and Advanced Mathematics Teaching

2.1 Study the History of Mathematics, Understand the Background of Mathematics, and Construct a Perfect Knowledge Framework

In the specific setting process of our country's advanced mathematics curriculum, it can be clearly found in the content of mathematics classroom that the content that does not talk too much about the history of mathematics is integrated into mathematics classroom teaching. There are more theorems and formulas and the corresponding verification process in the textbooks of advanced mathematics. Due to the large amount of content involved in the specific learning, the specific difficulty is relatively high, so the students will easily be full of hard to understand in the classroom

listening, knowing mathematical formulas is scary. And without the foundation of understanding, it will be more difficult to learn. Therefore, in such a passive learning process, students' learning efficiency and final knowledge mastery are low[1]. The subject of mathematics is very abstract and difficult to understand. In particular, advanced mathematics contains too many abstract theorems. Students at the undergraduate level have no basis for understanding, so it will be very difficult to learn. Each concept and theory has its own practical background and learning significance. Therefore, in the teaching process of advanced mathematics courses, teachers need to fully understand certain concepts, as well as the specific demonstration process, so that they can teach students in the classroom. Before the concept, teachers can first tell the background to the students, so that the students can fully understand the meaning of the history of mathematics and improve their interest in the subject of advanced mathematics. After fully understand the background, the students can also quickly grasp the knowledge of relevant theories. At the same time, it can also increase students' learning ability, as well as their ability to observe and think about things around them, and build a relatively complete framework for learning advanced mathematics knowledge, thereby promoting students' comprehensive development.

2.2 The History of Mathematics, Which can Activate the Classroom Atmosphere and Stimulate Interest in Learning

Compared with other subjects in the university, advanced mathematics has great rigor and abstraction. Students can improve their logical thinking ability and strengthen their independent thinking by learning the content of advanced mathematics[2]. At the same time, in the teaching classroom, teachers need to pay special attention to teaching theoretical formulas for students, and allow time for students to think about the origin of formulas. However, in traditional advanced mathematics teaching, teachers often make students recite some important formulas and theorems. Including the relevant verification process, if students do not understand the specific ideas and methods of the verification process, it will be very difficult in the memory process, and this kind of learning is also the least efficient, and the final learning effect is the worst. Students will lose interest in advanced mathematics learning, and even reject to learn psychology[3]. If teachers want to change this teaching situation, they need to cultivate students' interest in learning, and students will learn more actively on the basis of interest. Therefore, teachers need to guide students in the specific learning process and fully integrate into the history of mathematics. This knowledge background of advanced mathematics arouses students' enthusiasm for learning knowledge points. When teaching advanced mathematics content, teachers can also innovate a variety of teaching plans and teaching activities, which can improve the classroom learning atmosphere on the one hand, and on the other hand, it can make students active in the classroom and participate in the process of mathematics learning together. This kind of learning effect can also achieve a multiplier effect, and students can also improve their ability.

3. Strategies for the Integration of History of Mathematics and Higher Mathematics Teaching

3.1 Select Appropriate Mathematics History Textbooks and Properly Incorporate them into Advanced Mathematics Classroom Teaching

In the classroom teaching process of advanced mathematics, after understanding the textbooks, it can be found that the knowledge points involved in the textbooks of advanced mathematics are more and more abstract. Basically, the formulas and theorems in the textbooks that students need to learn are different from the basic knowledge that students mastered. If teachers explain according to the knowledge in the textbook, it is difficult for students to adapt to such teaching content and

teaching mode, and it is difficult to give positive feedback to such knowledge points, so it is easy to have disgust and rejection of the content of advanced mathematics.Therefore, in the teaching process of advanced mathematics, teachers need to fully integrate the relevant theoretical background of mathematics to fully attract students' interest and desire to learn[4]. As the makers of students' advanced mathematics learning content and the implementers of learning methods, teachers also need to take into account students' knowledge content mastery and students' learning emotions in the process of formulating classroom teaching models. These have a great impact to the quality of classroom teaching. Incorporating the history of mathematics into the classroom can add a touch of color to the content that is relatively boring and difficult to understand. Therefore, in the teaching of each class, teachers can choose the relevant history background of mathematics according to the theoretical knowledge and research process they need to explain, so that before the formal content explanation, the relevant background is infiltrated for the students, so that the students can also have a positive knowledge background in advance[5]. For example: before teaching the content of Fermat's theorem, teachers can explain some stories about Fermat and the background of Fermat's theorem, so that students can master the relevant background in the study of specific theoretical theorems and thus have Interested learning can also achieve the purpose of efficient learning. At the same time, students can also learn more about the background stories of famous mathematicians in history and increase their interest in advanced mathematics.

3.2 Use the History of Mathematics to Create an Environment for Advanced Mathematics Teaching and Activate the Classroom Atmosphere

From high school mathematics learning to advanced mathematics learning process, students have undergone a great change in the specific learning content and learning methods. In addition, students' thinking ability has also undergone great changes. It is necessary to continuously improve their learning ability so as to further master more advanced mathematics knowledge. At the same time, it is also necessary to effectively improve the classroom learning atmosphere in the classroom setting, so that students can all integrated into classroom learning. After mastering advanced mathematics, we can see that there are many difficult mathematical symbols and mathematical formulas in the textbook. If students cannot learn mathematics with interest, they cannot adapt to this level of knowledge learning. For students, this is also a change in learning. Therefore, in the teaching process, teachers can further improve the situation of students' learning difficulties through the teaching of mathematics history, enhance students' enthusiasm for learning, and actively participate in the study of advanced mathematics, teachers can also use multimedia information technology to make background information about the history of mathematics into pictures or videos to play to students, so as to improve students' scientific interest and research ability, and cultivate students' correct outlook on life and values.

3.3 Introduce Excellent Thinking Methods of Mathematics History into Teaching and Understand the Inner Culture Contained in Advanced Mathematics

Incorporating the history of mathematics into the classroom teaching of advanced mathematics can improve students' learning efficiency. Students can also understand and master the history of mathematics, understand the relevant theoretical proof process more quickly, and quickly devote themselves to the study of advanced mathematics, and through this process, students can also improve their mathematical learning and thinking ability and mastery of methods, which will also be of great help to their own professional course learning. Students can improve their ability well. The history of mathematics includes the entire development process and history of mathematics. Understanding the history of mathematics is also a foundation for learning advanced mathematics.

Students can also improve their skills and research interests after learning, understand the inner culture of advanced mathematics by learning the excellent thinking method of the history of mathematics. For example, calculus is an important learning content in advanced mathematics knowledge, and it also plays a very important role in daily life. Through calculus, we can explain the population problem, and propose measures for practical application, so as to improve the students' cognitive level and motivation in mathematics learning.

4. Conclusions

To sum up, in the classroom teaching process of advanced mathematics, teachers need to innovate a variety of teaching methods to help students comprehensively master mathematical knowledge, conduct detailed research on the verification of relevant mathematical theories, and fully integrate the history of mathematics into the classroom. In this way, teachers can also ensure the quality and effectiveness of their own classroom teaching, and cultivate more comprehensive talents who are useful to the society and the country.

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