Thoughts on Integrating Mathematical Culture into the Teaching of Real Variable Functions

Yong Tie

Qujing Normal University, Yunnan, Qujing, 655011, China

Abstract: The real variable function is an important part of the mathematics discipline and one of the important ways to cultivate students' mathematical analysis ability. Mathematical culture includes not only mathematical knowledge, mathematical thinking, but also mathematical aesthetics and mathematical history, as well as mathematicians and so on. This paper mainly expounds the concept of mathematical culture, and analyzes the meaning of integrating mathematics culture into the teaching of real variable function, and proposes the way of fusion.

1. Introduction

Nowadays, the demand for comprehensive talents in the society is getting higher and higher, which requires the school to pay more attention to the cultivation of students' subject quality when educating students. For mathematics teaching, how to make students apply knowledge to real life becomes the main content, especially the theoretically strong real variable function teaching, and integrating mathematics culture into the real variable function teaching becomes the trend of mathematics teaching.

2. Overview of Mathematical Culture

Mathematical culture concept. Mathematics is a cultural phenomenon. In addition to possessing the universal characteristics of culture, mathematics culture is a unique form of culture that is unique in itself. These uniqueness distinguishes mathematics culture from other cultures. Compared with mathematics itself, the concept of mathematical culture is produced relatively late, and its connotation is exponential thinking, thought, method, spirit, concept, development and formation in terms of easy-to-understand expression. If the concept is expanded, then the mathematical culture also includes mathematicians, mathematical history, mathematical aesthetics, mathematics education, humanities in mathematics, the relationship between mathematics and other cultures, and so on. That is to say, the core of mathematics culture is the modern mathematical science system, whose components include mathematics related spirit, mathematical thinking, mathematical methods, mathematical language, etc., and a form of human culture combined with other cultures related to mathematics [1].

The significance of mathematics culture to mathematics teaching. As an important part of mathematics teaching, mathematics culture itself covers a very wide range, so the integration of mathematics culture into mathematics teaching can greatly enrich the content of mathematics teaching, so that the content of mathematics teaching is more lively and lively. In traditional mathematics teaching, the teaching mode is relatively fixed, usually including the following definitions, elaboration theorems, mathematical calculations, mathematical proofs, etc. The teaching method is relatively monotonous, and the integration of mathematical culture will convey the story behind the classical mathematical knowledge to the students. Make the original boring mathematics teaching lively and interesting. In addition, the American Society of Mathematics Culture enhances students' aesthetic ability to actively discover the beauty of mathematics while learning mathematics. The mystery of mathematics culture can stimulate students' interest in exploring, in order to further realize the effect of mathematics teaching.

As an important component of human knowledge, students' learning of mathematics cannot be

limited to textbooks, but should be extended. Integrating mathematics culture into mathematics teaching, giving full play to the extensive characteristics of mathematics culture itself, focusing on all aspects related to mathematics in front of students, is conducive to broadening their horizons, thus helping students to form correct mathematical concepts, and their values are also Optimized during this process.

In the process of mathematics teaching, we should not only focus on the transfer of textbook knowledge to students, but should cultivate their mathematical thinking, mathematics understanding ability, mathematical judgment ability and mathematical analysis ability, in order to cultivate students' ability to use mathematics knowledge to solve practical problems [2]. The mathematics culture pays more attention to mathematics literacy. Therefore, integrating mathematics culture into teaching can not only cultivate students' mathematical thinking, but also enhance students' mathematics spirit and mathematics thinking.

3. The Way to Integrate Mathematics Culture into the Teaching of Real Variable Function

Teaching the history of mathematics to cultivate students' mathematical spirit. As a highly practical subject, mathematics reveals the mathematical spirit contained in it with its uniqueness, including the spirit of seeking knowledge, the spirit of seeking truth, the spirit of exploration, the spirit of doubt, and the spirit of innovation. In mathematics teaching, we should integrate the teaching of mathematics history according to the actual teaching content, so that students can understand the source of mathematics, the overthrowing and establishment of mathematics concepts, and the stories of thousands of mathematicians who are striving for mathematics on the path of mathematics. For example, the generation process of mathematical sets and the mathematician Cantor, the process of generating integral theory and the spirit of Lebegberg's pursuit of integral theory on the road of pursuing integral theory, and never giving up, etc. [3]. While revealing the twists and turns of the development of mathematics, these mathematical historical contents also teach students how to use mathematics to view problems, and learn the mathematicians' hard work spirit, which can stimulate students' interest in mathematics and cultivate their mathematical spirit and thinking ability. At the same time, it can also guide students to establish correct values and help students develop their personality. The integration of mathematics culture into the teaching of real variable function enables students to face this theoretically strong subject with correct attitude and cultivate the spirit of mathematics in the process of learning.

Analyze mathematical thinking and guide students to use mathematical thinking. As a theoretically strong subject, the teaching of real variable functions includes many mathematical ideas, such as infinite thoughts, etc. Integrating mathematical culture into the teaching of real variable functions can cultivate students' mathematical thinking in a subtle way, thus making students Forming mathematical thinking, and paying attention to solving problems with mathematical thinking in daily life, to achieve the fundamental purpose of mathematics teaching [4]. Many traditional mathematics teaching modes only focus on the cultivation of students' mathematics skills, while ignoring the most important mathematical thinking, which leads to the avoidance of the mathematics teaching mode, so that students can not deeply understand some innovative mathematical theories, such as the concept of infinity. This concept itself breaks the traditional thinking of human beings. If the mathematical thinking is weak, students may not be able to deeply understand the concept of infinity. This phenomenon will cause students to lose interest in mathematics learning for a long time, which is not conducive to the development of mathematics teaching. The integration of mathematics culture into the teaching of real variable function can effectively cultivate students' mathematical thinking, so that they can see the interesting side of mathematics, thus stimulating students' enthusiasm for inquiry. For example, in the teaching of integral theory, teachers should actively innovate the teaching method, integrate Lebegue's story, and use the form of doubt to guide students to understand the purpose of Lebegue's creation of integral theory, and use the integrand of the integrand to replace the domain division. Factors, the way to break the limited coverage limit of the measurable measure, the reason why the measurable set cannot directly use the definition of the internal and external measures, the reason why the

measurable set uses the conditions of the Karatoodori condition, etc., these questions can prompt the students to play Subjective initiative explores the essence of real-time functions in depth, and inspires students to use mathematical thinking to think and solve problems. By analyzing these questions, students can improve their mathematical thinking ability and make them understand the fun of mathematics to stimulate students' curiosity. At the same time, mathematics thinking also contains many philosophical ways of thinking. For example, many mathematics knowledge can be discussed from different angles, such as inner point, outer point and boundary point knowledge, while some knowledge is special and general relationship, such as Simple functions and measurable functions, and so on. The philosophical thoughts incorporated into mathematical thinking enable students to understand and master the real-world functions with higher-level knowledge, and also enhance their mathematical literacy in the subtle.

Telling the formation process of mathematics knowledge, stimulating students' enthusiasm. The generation and development of mathematics is an ineviTable outcome of history, such as the Lebesgue integral in the real variable function. In the middle of the 18th century, astronomy and physics were developed rapidly. Mathematics was the basic subject of both, so it also made people have higher requirements. The most significant problem at that time was how to solve the integral of the morbid function. The problem of function is basically generated in real life, and finally it is also used to solve the problems in real life. This makes the Lebesgue integral theory which is specific to the modal function integral problem appear as an ineviTable result [5]. For the general integral problem, the integrand region problem and the integrand function are the two main elements. Therefore, in the teaching of the real variable function, it is necessary to analyze according to the corresponding solution, if the practical function is solved according to this idea. If you have a problem, then the student will naturally know what the corresponding way is. The simple function is also an important part of the real function course. When teaching, the teacher should first introduce the reason for the introduction of the simple function, then explain the relationship between the simple function and the measurable function, and at the same time, the simple function and The concept of the general function in the integral theory is clearly explained. In this way, the students have an understanding of the overall teaching ideas of the real variable function. Learning the real function in the context of understanding the teaching ideas, finding problems and solving problems becomes An ineviTable trend. When students learn the set theory in the mutation function, under the influence of mathematics culture, the students will have a qualitative leap in the understanding of the element problems in the set, and when the students understand the relevant knowledge of the maximum cardinal set proof, combined with mathematics Relevant knowledge in culture, such as Hilbert's 23 questions, will help students broaden their horizons and cultivate their divergent thinking after they see the relationship between them, thus enhancing students' enthusiasm for learning and improving their motivation for mathematics exploration. , to achieve the purpose of the real variable function teaching.

Pay attention to the connection between mathematics and other disciplines, and cultivate students' ability to apply mathematics. Mathematics is the foundation of many disciplines. Mathematical culture therefore has a wide range of abilities. Integrating mathematics culture into the teaching of real variables can strengthen the connection between real functions and other disciplines, so that students can see the wide applicability and applicability of mathematics. . Effectively combining the length, volume, and area in mathematical analysis in the teaching of real variable functions, students can see the knowledge characteristics of real variable functions based on the previous mathematical knowledge. It is the student's re-upgrading and re-exertion of previous mathematical knowledge. Improve and re-recognize and effectively broaden their mathematical thinking. When combining the mathematics culture to teach the real variable function, we should also pay attention to popularizing mathematics aesthetics to students. For example, after completing the Cantor three-division in the real variable function and its nature teaching, the teacher will timely introduce the Koch snowflake curve, the British coastline, These examples are given to students. These concrete examples not only allow students to feel the aesthetics of fractal geometry, but also recognize the charm of mathematics, and also let them know the application and

ways of fractal geometry in real life. Only when students fully understand the applicability and practicability of mathematics and understand the ways to apply mathematics in real life can they be used to deal with real life and mathematics using the mathematical knowledge, mathematical thinking and mathematical methods that have been learned. Related questions, or problems that can be solved with mathematical knowledge. When students use mathematics knowledge to solve problems in real life, it is also an exercise for their mathematical thinking and mathematical consciousness. It can promote students' own mathematical concepts and build their own mathematical systems, which in turn will improve the use of mathematical knowledge analysis and The ability to solve practical problems and achieve the intended purpose of mathematics teaching.

Innovative teaching methods to enrich the mathematics classroom teaching mode. For the real variable function, the traditional teaching mode is mainly the teacher tells the mathematics theory knowledge, the students carry out the relevant memory mode, and the teaching method mostly adopts the chalk board form, and the multimedia courseware is rarely used. Integrating mathematics culture into the teaching of real variable function will make the classroom teaching content of the real variable function more abundant and the teaching method more flexible and diverse. For example, the teacher can accord the specific teaching content of the real variable function. Incorporate relevant mathematical and cultural knowledge to help students expand their horizons and improve their mathematical thinking skills. At the same time, the mathematics culture contains many vivid and interesting mathematical historical stories. These stories appear in the form of pictures and texts, which is easy to impress students. The use of advanced intelligent devices in the teaching of real variable functions can visually display the geometrically beautiful lines in various mathematical applications, and analyze their formation process in the form of moving pictures, so that students can deeply understand the aesthetics of mathematics and the way of formation. The combination of mathematical culture and real-time functions, and the use of advanced animation, video and other forms of teaching, can fully stimulate students' interest in mathematics and enhance their mathematical curiosity.

4. Conclusion

In short, the integration of mathematics culture in the teaching of real variable function allows students to understand the history of mathematics, and has a holistic understanding of mathematics, and has an understanding of the applicability, practicality, aesthetics, and connections between other disciplines. In order to stimulate their interest in mathematics, build their own mathematical systems in the continuous exploration of mathematical knowledge, cultivate mathematical literacy, and thus achieve the fundamental purpose of mathematics teaching.

References

[1] Nie Jingpin. Based on the teaching of mathematical culture concept [J]. Science and Technology Information, 2018, v.16; No.510 (09): 180-181.

[2] Bao Hongmei, Xu Xinli. Mathematical Culture Research and University Mathematics Teaching [M]. Suzhou University Press, 2016.

[3] Yan Minzhang. On the History of Mathematics and Mathematical Culture [J]. East, West, North and South: Education, 2018 (2): 362-362.

[4] Yang Dandan. The Development of Mathematics Infinity Thought--Contor' s Set Theory Side[J]. New Curriculum (Secondary), 2017(6).

[5] Huang Rongli. Teaching Discussion on Lebegue Integral Thought of University Mathematics Majors [J]. Educational Observations (Preliminary), 2015, 4(2).