

Exploration and Practice of Integrating Mathematical Culture in Advanced Mathematics Classroom

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Keywords: mathematical culture; higher institutions; teaching classroom; integration

Abstract: At present, China's flourishing education cause enters a new stage. For colleges and universities, advanced mathematics puts forward higher requirements for teachers' comprehensive quality. In today with promotion of quality-orientation education, the teaching mode of advanced mathematics tends to make transformations to adapt to the development of the era. The value and function of mathematical culture has aroused the attention of the mathematical field. Based on this, exploration and practice of integrating mathematical culture in advanced mathematics classroom is inevitable, which is also the basic guarantee for the implementation of new round of policy reform of China's higher mathematics education.

With the constant development of the times, China's educational mode also changes. Especially for advanced mathematics, in actual implementation, it involves extensive scope, including the comprehensive mastering of mathematical professional knowledge and thorough understanding of mathematical culture. Mathematics has a long history, and the essence of mathematical comprehensive quality is to combine mathematical culture concepts and knowledge ability so as to realize the goal of mathematical quality education. Its realization relies on the thorough reflection of cultural essence of mathematics. Besides, in education and teaching, it is important to integrate mathematical culture concepts in the entire process of mathematical education. The combination of mathematical culture and mathematical teaching is realized to guarantee the quality of advanced mathematics education. With the comprehensive instillation of Chinese quality-oriented teaching policy, people pay more attention to the cultivation of students' comprehensive quality, and effectively enhance students' innovative ability starting from students' interests and hobbies [1].

1. Research Objectives and Theoretical Foundations

1.1 Research Objectives

At present, in the teaching of advanced mathematics, there are always some problems, which are shown in various aspects. First of all, many students think that mathematics learning is a process of constant practice, but it is precisely because of long-term mathematics exercises that students are weary of mathematics. Secondly, there are some teachers who are pursuing the scores in the process of mathematics teaching, focusing on explaining mathematical concepts, formulas and theorems, etc., and ignoring the popularization of mathematics culture. Besides, they have insufficient understanding of students' interests currently, which makes it difficult for students to have an interest in the teaching activities of teachers. In addition, there is still a large part of teachers with deviation in understanding the teaching concept of mathematics. In the process of mathematics teaching, students are required to memorize. This kind of teaching method will arouse students' dislike when they mention mathematics, which is not conducive to the implementation of Chinese mathematical education. In developing mathematics teaching, it is very important to pay attention to precisely grasp its teaching ideas, which is very important, to introduce rational and interesting teaching ideas into teaching activities, which will add attraction to the whole mathematics teaching activities [2]. In the past, for a long time, China's advanced mathematics teaching is facing a severe crisis. In view of the actual situation of advanced mathematics education in China at this stage, the methods of mathematics teaching in colleges and universities can be first analyzed and discussed

through questionnaires and other forms, starting from the perspective of the teacher-student exchange and the integration of mathematical culture, and the actual situation of teachers' own mathematics and cultural literacy can be explored, which is very important. Besides, it is necessary to investigate the integration of mathematical culture and students' mastering of mathematical culture currently, make efforts to find out drawbacks and insufficiencies, and put forward targeted solutions. Mathematical culture can effectively help students recognize the interestingness of mathematics, further guide students to understand mathematical course from the perspective of culture, overcome their fear of learning mathematics, and effectively enhance the quality of mathematical learning.

1.2 Theoretical Foundations

The theoretical foundations for integrating mathematical culture into the teaching of advanced mathematics is mainly reflected in constructivism and humanism mathematical learning.

Constructivism, put forward by scholars of education field in the world in the mid-1980s, is the academic theory processed based on cognitivism that everyone shall have exploring spirit and increase the cognition of the world by their own learning. Constructivists believe that the subject of cognition is mainly the process of knowledge construction based on the experience of knowledge activities, and there is great difference in everyone's understanding of the same thing, which creates a unique relationship between people that is supported by various knowledge. In terms of constructivism, in order to ensure the quality of its application, it is required to start from these two concepts.

On the one hand, it is necessary to explore and analyze the mathematical learning of constructivism. The process of learning cannot be just a single process of acceptance. The position of teachers and students should be arranged reasonably. In traditional classroom teaching activities, teachers are often in the main position, and students can only accept passively, which is not conducive to improving the overall level of mathematics teaching. Constructivist mathematics teaching concept regards students as the subject of educational activities. For higher mathematics, in the process of learning, there are high requirements for students' logical thinking ability. It mainly emphasizes that students should also be the subject of ideology in the process of learning, which is very important. Under the influence of the teaching environment, learners should develop an independent learning experience that integrates with the external environment. Learners should also develop their own strong operational ability and take the initiative to continuously accumulate their cognitive structure and experience. In this way, the dominant role of students is fully reflected in learning [3]. In mathematics learning, students often have a different degree of understanding of knowledge points. This is mainly related to the different thinking modes of each student. Teachers should retain the students' original thinking mode and then explain new thinking patterns, which can play a role in continuously expanding students' learning ideas. The process of mathematics learning should be the process that students take the initiative to accept, but not the process of teacher's single knowledge cramming. This is also the most direct teaching idea elaborated by constructivist mathematics teaching concept [4]. Next, it is required to analyze the mathematical teaching concept of constructivism. The constructivists also elaborate and analyze the concept of mathematics teaching, which is directly related to the current environment of advanced mathematics education and the quality of teaching in China. Teachers are the leaders in the educational process. For traditional mathematics teaching mode, a large number of teachers often fail to realize their important responsibilities, and fail to pay attention to improving the overall quality of learners and the long-term development, so that students' mathematics scores cannot be effectively improved and even they lose interests in mathematics learning [5].

On the other hand, the theoretical foundation of humanism is also significant. The theory of humanism was first born in the 1950s and was concluded by American psychologist Maslow and others. From the perspective of humanistic mathematics learning, it advocates meaningful learning. The learner is a single individual. The process of mathematics learning is also a process of universal participation, which has certain requirements for students' logical thinking ability. At the same time,

mathematics learning is also an individual's initiative process. When students learn mathematics, they should accurately and clearly define the learning objectives, which is very important, so that learning activities can be more meaningful. Learning should also be permeable. Students' understanding of mathematics learning is traditional, and penetrating learning can effectively cultivate students' thinking pattern [6]. Finally, regular learning evaluation is also very important and should be done by students themselves, with emphasis on the relationship between the content and the subject of learning. In the process of learning, students should also emphasize the combination of "emotion" and "knowledge", which is different from traditional learning methods. Traditional teaching methods often only pay attention to test scores, which also leads to the ignorance of students' comprehensive quality in teaching and certain drawbacks. However, the humanism learning concept mainly emphasizes students' learning feelings as the subject in the educational process, advocates meaningful learning, and proposes an effective combination of "knowledge" and "emotion". The main idea is to rely on human emotional, psychological and spiritual interaction to generate basic motivation for learning, so that their own learning consciousness is always positive, which is also very helpful for the mutual coordination of students' inner emotions. For the humanism mathematics teaching concept, the humanistic teaching method pays more attention to the feelings of people in the process of education, and emphasizes that educational activities should promote the all-round development of students' comprehensive quality. At the same time, the humanistic teaching concept also advocates students to carry out meaningful learning, and uses emotion as the basic learning motivation [7]. At the same time, it also requires to use a variety of evaluation methods to assess students' learning, so that the comprehensive level of students can be effectively improved. In education way, it opposes the traditional teacher-centered and textbook-centered education model, and maintains a relatively equal relationship between teachers and students, which will enable students to enhance their confidence in the learning process.

2. Research Contents

With reference to a large number of related literatures, it can be found that the research on mathematical culture in many colleges and universities abroad has reached a new height. Therefore, the author has carried out a more detailed and comprehensive research to absorb the essence and discard the gross, and discusses and analyzes related knowledge points. After the survey of the mathematical and cultural literacy of teachers and students in colleges and universities in China, it is found that mathematics teachers often fail to fully realize the importance of mathematical culture in mathematics teaching, and rarely mention it in the process of classroom teaching, with lower integration of mathematical culture. After investigating the influence of mathematical culture on students' mathematics learning, it is found that its influence among students is very small, which has a great impact the development of students' comprehensive quality. Therefore, according to the understanding of the current situation of advanced mathematics education in China, this paper puts forward some suggestions to provide reference for China's educational cause [8].

3. Research Effects

3.1 Research effects on students

3.1.1 Students' value of mathematical culture is established

Mathematics education has its unique reflection of functional value. At the same time, mathematics is also a kind of culture, which is the product of people's abstract thinking. Mathematics teaching is also a process with continuous development and change. In this process, students should constantly improve their mathematics level. This will greatly help students to develop independent thinking and three-dimensional thinking mode, not only in the improvement of mathematics scores, but also bring this mode of thinking to other courses, and also bring it to life [9]. Mathematical knowledge itself has always been in a process of continuous development, which

involves the process of making mistakes and improvement. Only by understanding the changes in mathematics can we better grasp the laws of mathematics learning. At the same time, the integration of mathematical culture in mathematics classroom teaching is also more helpful for students to accurately understand the relationship between mathematics science and the objective world. Besides, many students develop a strong interest in mathematics learning.

3.1.2 Students' subject consciousness is improved

The combination of mathematical culture and mathematics teaching is helpful for students to feel their important status in educational activities. In the current educational environment, teachers and students are interdependent. When students become the subject of the educational process, teachers will become the guides for students' learning. At this time, teachers should fully realize their important duties and strictly demand themselves, and actively communicate with students to understand their current mathematics learning situation, which is more convenient for teachers to carry out teaching activities.

3.2 Research effects on teachers

3.2.1 Teachers' mathematical and cultural literacy is improved

When the combination of mathematical culture and mathematics teaching, it also puts forward higher requirements for the professional quality of teachers, mainly because of the many aspects involved in mathematical culture. For teachers, it is difficult to have comprehensive and meticulous mastery, which requires teachers' excellent mathematical professional competence and continuous expansion of knowledge. After the research, it has established the concept of lifelong learning for teachers, and fully mobilized the enthusiasm of teachers for self-development, which provided new possibilities for the exploration of China's teaching career.

3.2.2 Teachers' mathematical culture concept is established

For teachers, in the past, for a long time, their understanding of the importance of mathematics teaching is relatively one-sided, paying attention to the knowledge teaching of basic mathematics, without expanding teaching, ignoring the importance of mathematics culture education. As a result, it is difficult for students to understand the inevitable connection between mathematics and daily life, which is not helpful for students to improve their overall mathematical quality [10]. Mathematical teaching should also be combined with the current social structure, the development background of the times, philosophy, culture, etc., so that people's understanding of mathematics is no longer one-sided, which will also greatly help students' future development.

4. Conclusion

In summary, at present, China has begun to integrate mathematical culture into the process of advanced mathematics education, and students' understanding of mathematical culture has begun to become more and more in-depth. In this era, teaching methods of mathematical culture is reflected in various aspects, which requires teachers' extensive knowledge and students' clear understanding of their subject role in teaching activities. This is helpful for students' development in the future. According to current Chinese advanced mathematics education, the teaching staff of advanced mathematics shall make constant efforts, improve their comprehensive quality and take improving students' mathematical comprehensive quality as the only goal of education activities.

Acknowledgement

Fund Project: Research projects in humanities and social sciences in Nanchang Institute of Science and Technology. Project Name: Research on Cultivating Mathematical Culture Competence of Minority College Students in Applied Private Undergraduate Colleges –Taking Nanchang Institute of Science and Technology as an Example. Project No.: NGRW-17-21.

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