

The Influence and Function of Mathematical Culture in University Mathematics

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Abstract

Because of the compression of all classes of mathematics in University, the teaching of mathematics in University tends to focus only on the teaching of knowledge, but it neglects the integration of mathematics culture and course content, reduces the culture and integrity of mathematics, and has hit the students' enthusiasm for learning mathematics. This paper explores the significance of mathematical culture infiltration in college mathematics classroom teaching practice.

Keywords

Mathematical Culture, University Mathematics; Mathematics Accomplishment; Course Content; Students

I. Introduction

Ye Zhonghao, the chief planner of the famous translation of popular mathematics, and of Shanghai Education Publishing House, has such a understanding of Mathematics: "mathematics is a culture, and culture is something to be inherited." Therefore, mathematics teaching process is not only a process of spreading mathematical knowledge, but also a process of inheriting and developing "mathematical culture". Only university mathematics teaching based on "mathematical culture" will bring forth vigorous vitality. Therefore, it is worthwhile for university mathematics teachers to pay attention to, think and explore in the university mathematics classroom.

II. Help Students To Form Good Mathematical Accomplishment

In order to help students form good math accomplishment, we should not only attach importance to imparting knowledge of mathematics, but also help students build up a correct view of mathematics. The concept of mathematics is the basic view and summary of mathematics, including the understanding of mathematics, the scientific value, the humanistic value, the social value and the historical value of mathematics. This is a multi angle and omni-directional mathematical perspective. Let students understand the origin and development of mathematical knowledge, rather than simply learning mathematical knowledge, skills stacking and logical explanation.

For example, when we explain the concept of calculus, we can penetrate some cultural meaning of calculus:

1. Cultural influence on various disciplines

The development of calculus not only changed the appearance of the mathematical world from static to dynamic, but also made mathematics vigorous, and then the rapid development and unprecedented prosperity of modern mathematics. Calculus is a necessary condition and powerful tool for the development of the industrial revolution, big industrial production and modern society.

Modern means of transportation such as C919 large aircraft and high speed rail are the direct result of calculus. Newton discovered the law of universal gravitation with the help of calculus. Now, chemistry, biology, geography, economics and other disciplines must be inseparable from calculus. Every step of their progress has the silent contribution of calculus.

2. The influence on human material civilization and spiritual civilization

Calculus not only has become the foundation of natural science and engineering technology, but also penetrates into people's extensive economic and financial activities, that is to say, calculus is also widely used in the field of Humanities and social sciences. The establishment and improvement of the calculus theory also made the bishop of Bekele and other theological believers completely bankrupt the attack of calculus, and it had a profound influence on the development of modern mathematics in thought and method. Calculus not only enlightens philosophy, but also has profound influence on human culture.

This allows students to understand the position of calculus in scientific ideas and the connection between mathematics and other subjects. They will have a comprehensive and profound understanding of calculus and help them to learn in the course of the future. If the calculus is only divided into the category of natural science, the other mathematical values will be ignored, which is unfavorable to the students' formation of multiple, dialectical and comprehensive mathematical concepts. Only by placing the calculus in a broader context in all levels of society, can students form a correct mathematical outlook and have a full and correct depth of mathematics. The understanding and understanding of engraved form a good mathematical accomplishment.

III. Help students to promote rational thinking

Rational thinking is made up of three elements: independent thinking, logical reasoning, and attention to evidence. Rational thinking, as an indispensable part of the students' mathematical literacy, is a historical, scientific and philosophical reflection. This is a critical thinking, difference and creative thinking, and a higher level of moral reasoning. In the course of teaching, the subject that can effectively train people's rational thinking quality is mathematics.

Many of the specific knowledge in mathematics, especially high mathematics, is not used by most people in life. But through the study of mathematics, the unique mathematical thinking, the logic and rigour of mathematical thinking are beneficial to all the professions that people will be engaged in in the future, and it benefit all the life.

Therefore, in primary school, the teaching of mathematics is in the primary school. In the process, teachers should pay more attention to the improvement of students' thinking ability([2]-[7]).

IV. Help students to improve the ability to apply mathematics

With the rapid development of modern science and technology, mathematics has become an important part of modern civilization, and has been widely used in all walks of life. In ancient China, mathematics has been applied to people's daily life, and many applied mathematics are recorded in books such as "Zhou Jing Jing" and "Nine chapters of arithmetic". Mathematics is closely related to the birth and life of human beings. Many practical problems in real life are involved in mathematics.

Topology is a mathematical concept. It refers to the nature of the object in continuous change, because of the pioneering work in topological phase transformation and the phase of matter topology, Solis (David J.Thouless), Holzer Dan (F. Duncan M. Haldane) and Coster Liz (J. Michael Kosterlitz) share the 2016 Nobel prize in physics^[1].

The courses and competitions in the application of mathematical modeling have gradually been recognized by the students and the society. The thought of mathematical application is integrated into the heart of every college student, and the state is paying more and more attention to the basic education.

As a university teacher, we gradually permeate mathematics culture in the college mathematics classroom, which is beneficial to strengthen the mathematics application education, improve the students' understanding of mathematics, and cultivate the students' ability to use mathematics flexibly.

V. To stimulate students' interest in learning

Most students feel chaotic mathematics is very abstract and difficult to learn. We can use the following chaotic games as classroom introduction,

(1) Mark three points on a piece of paper as shown : (1, 2), (5, 6), (3,4).

(2) Take a point on the paper as a starting point, and then throw a dice.

(3) Rule: if the dice is stabilized at 1 or 2 points, the middle point of the distance between the starting point and the point (1, 2) is the new starting point; the case of throwing 3 or 4 points and 5 or 6 points is similar.

(4)Continue the third step indefinitely.

At the same time, let the students draw the corresponding drawings. And then continue to expand that it is not the first time that randomness has finally become orderly. In eighteenth Century, the French naturalist, count Buffon, designed the needle throwing problem and linked pi to the probability of favorable results. Similarly, in 1904, R. Chet Reis found that the probability

of two random numbers of Coprime was $\frac{6}{\pi^2}$. Michael Barnsley first considered randomness as the basis for establishing natural shape models. So he invented the chaotic game. There are many ways to play this game. For example, a coin or a dice can be used to generate a random event. The rules used are also flexible. The above play uses three fixed-point, one random dot and one dice. The design completed is amazing. A chaotic process can produce orderly results.

In this way, students will not feel dull when they are learning. Therefore, how to let the students have enough interest in learning in the classroom and let the students learn in a pleasant atmosphere has become an unimportant link in the design of teaching. And the mathematics culture has just become the medium of the teacher's active classroom atmosphere. Field, to cultivate students'

comprehensive mathematical thinking, so that mathematics is no longer an abstract and boring subject, but a subject that keeps pace with the times, has vitality, and has fun.

Summary

In a word, the extensive and effective infiltration of mathematical culture in college mathematics teaching is beneficial to students to form good mathematical literacy, to cultivate students' mathematical core literacy, to promote students' rational thinking, to stimulate students' interest in learning, and to improve students' ability to apply mathematics.

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