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Introduction of Mathematical Class in View of Mathematical History

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Abstract
Class import is the beginning of a class, and an exquisite import is an important part of the success of a class. The introduction of new lessons in mathematical history has the function of stimulating students' interest in learning, creating a favorable mathematical situation and experiencing the cultural and applied values of mathematics, which is in line with the purpose of classroom introduction. A new approach to the introduction of mathematical history is proposed to design an exquisite course import: (1) the introduction of the thread of mathematical development; (2) the introduction of historical topics; and (3) the introduction of mathematical stories.

Keywords: *Class Import; Mathematical History; Mathematical Teaching; HPM*

Importance of Class Import

Class import is the beginning of a class. As the saying goes, "a sound start is half the success", an exquisite classroom introduction can arouse students' desire for knowledge, stimulate their curiosity and enhance their attention in just a few minutes, and the classroom atmosphere is enthusiastic; while a failed classroom introduction can hardly stimulate their desire for knowledge and inhibit their initiative, making it difficult for them to concentrate and the classroom atmosphere is repressed. The purpose of the course introduction is twofold: first, it is an intrinsic purpose, i. e., to attract students' attention, to stimulate interest in learning, to arouse motivation for learning, to clarify the purpose of learning, and to establish the link between knowledge; second, it is to express the purpose, i. e., to enable students and teachers to enter the classroom teaching in a timely manner in a better state and to enter the role [1].

Necessity of Importing New Courses in Mathematical History

(I) Stimulate students' interest in learning

As Comenius put it, interest is one of the main ways to create a happy and civilized educational environment. The inherent purpose of classroom import is to stimulate students' learning and cause their motivation for learning, which is difficult to achieve by traditional direct import and review import. The introduction of mathematical history by teachers is easy to stimulate students' interest in learning. For example, students tend to take the initiative to solve problems through the introduction of historical topics, especially when they cannot solve them, they will eagerly wonder what knowledge and methods are needed to solve the problems, so students' desire for knowledge is stimulated and their interest in learning is stimulated.

(II) Create a favorable mathematical environment

A favorable import will create a favorable mathematical environment, which is conducive to students' natural learning of new knowledge and in-depth learning. The introduction of mathematical history can create a favorable mathematical situation. The process of the emergence and development of a mathematical concept is the most natural mathematical situation in which mathematical knowledge is generated. The mathematical context created by teachers is unified in historical order, logical order, and psychological order according to the teaching method, which is easy to be understood and accepted by students, and is in line with the thread of historical development, making it easier for students to generate mathematical knowledge more naturally.

(III) Experience the cultural and applied value of mathematics

Mathematics is a culture and is of applied value, but most students think that mathematics is problem-solving, and they have no idea why it is necessary to learn mathematics and what is its use. Most teachers also take exams as the baton when teaching new courses, and they can teach knowledge how they take exams. They fail to clarify the origin and application value of a concept, and just focus on what effect they have on the exams. Introduced through the history of mathematics, students will find that the emergence of mathematical concepts is for a reason, i. e., to solve a certain practical or mathematical problem, so that mathematical concepts, theorems and formulas will be abstracted from the real world and applied to solve practical and mathematical problems. Students experience a process of the development of mathematical concepts and realize that the development of mathematical concepts is not achieved overnight, but is abstract from real life and constantly developing, and experience the cultural and applied value of mathematics.

Methods for Importing New Courses in Mathematical History

(I) Introduction of Mathematics Development

The development of mathematical concepts itself is a favorable mathematical situation in which students go through the process of being a mathematician in studying a mathematical concept and naturally generating mathematical concepts. For example, with the introduction of the plural, many teachers solve the unitary quadratic equation $x^2+1=0$ by giving students solutions, so it is difficult for many students to understand the meaning of their teachers and why an equation that has proven to be unsolved in junior high school. For students, equation $x^2+1=0$ is meaningless and need not be taken into account. Then why do you have to introduce new numbers to make it have a solution [2]? The solution of a unitary quadratic equation $x^2+1=0$ is a failed introduction that is not based on the thread of historical development and the psychology of students, but entirely based on logic.

The historical finding of the plurality is due to the rooting formula $x=\sqrt[3]{\left(\frac{q}{2}\right)+\sqrt{\left(\frac{q}{2}\right)^2+\left(\frac{p}{3}\right)^3}}-\sqrt[3]{\left(-\frac{q}{2}\right)+\sqrt{\left(\frac{q}{2}\right)^2+\left(\frac{p}{3}\right)^3}}$ of the quadratic equation $x^3+px=q$. Italian mathematician Bumbeli found that there would be a negative square problem when using this formula to solve the quadratic equation, and the quadratic equation must have a solid root, which means that the real number can be expressed by the square root of the negative number [3]. To solve this problem, mathematics began to study the plurality and its characteristics. Teacher Wang Haiqing first introduced the rooting formula of the unitary quadratic equation by reviewing the rooting formula of the unitary quadratic equation, and asked students to solve the formula $x^3-6x=0$ easily, which is 0, $\pm\sqrt{6}$ respectively. The result of the formula solution is $\sqrt[3]{\sqrt{-8}}+\sqrt[3]{-\sqrt{-8}}$ that it causes students' cognitive conflict and stimulates their interest in learning. The square root of negative numbers and their nature [2]. Introduced according to the historical process of finding the plural, it is easier for students to accept the plurality and experience the necessity of the emergence of the plural.

(II) Introduction of History Titles

Introduction of historical topics refers to a way that teachers display mathematical questions in history at the beginning of the classroom, where students try to solve them to introduce new knowledge. For importing mathematical knowledge with historical topics, teachers should pick those that are closely linked, interesting and somewhat difficult to learn from in this class. Fond topics are conducive to stimulating students' interest in learning, while those with a little difficulty are conducive to stimulating their desire for knowledge and making them urgent to learn new knowledge to solve problems. For example, the introduction of the equal proportion number sum formula, introduced by Teacher Wu Xianrong with Rhind paper grass problem 79: There are 7 houses, each house has 7 cats, each cat consumes 7 rats, each rats consumes 7 wheat turtles, each wheat turtles contains 7 units of wheat. What is the total volume of the house, cat, rat, wheat turtles and wheat? It comes from life, which is also more interesting, which is easy to stimulate students' interest in learning, and it is easier for students to list its formula $7+7^2+7^3+7^4+7^5=19607$. With the help of $7+7^2+7^3+7^4+7^5$ for further questions, the teacher will sum up the series with equal ratios, but how will it be summed up if the number of items increased. Problems were also asked: the first term a_1 of a known series $\{a_n\}$ with equal ratio q, and the sum S_n of the first *n* terms of a series $\{a_n\}$ were obtained. Students found it difficult to solve, which aroused their thirst for knowledge [4].

(III) Introduction of mathematical stories

There are many interesting stories in the history of mathematics that are used for the course introduction to stimulate students' interest in learning and attract their attention. For example, the historical finding of unreasonable number is due to the proposal of the reasonable number theory in the introduction of unreasonable number, but the unreasonable number is the content of the first semester of the first year of junior high school, and the reasonable number theory is the content of the second year of junior high school. Hence, teachers cannot introduce unreasonable numbers with the help of the reasonable number theory. Nevertheless, people were aware of unreasonable numbers early on, but the concept of unreasonable numbers was not put forward. There is a story about Socrates teaching slave children's geometry, in which people paid attention to unreasonable numbers early on. The story is as follows:

Socrates draws a square with a side length of 2 feet, whose area is equal to a square foot Then Socrates painted this square diagonal in front of the child. So he asked the child what was twice the length of the edge of the square. Initially, the child said that the side length of the square he was looking for should be 4 feet, but after questions and demonstration graphics, he realized that the area of the square with a side length of 4 feet is 16 square feet, rather than 8 square feet. He also extrapolated that the side length of the proposed square should be a square foot, but he then realized that the area of the square with a side length of 3 feet was a square foot of steel feet. Finally, a square was drawn by the child with the diagonal length of a known square as an edge under the inspiration of Socrates, which solved the problem [5]. The side length of this square is $2\sqrt{2}$.

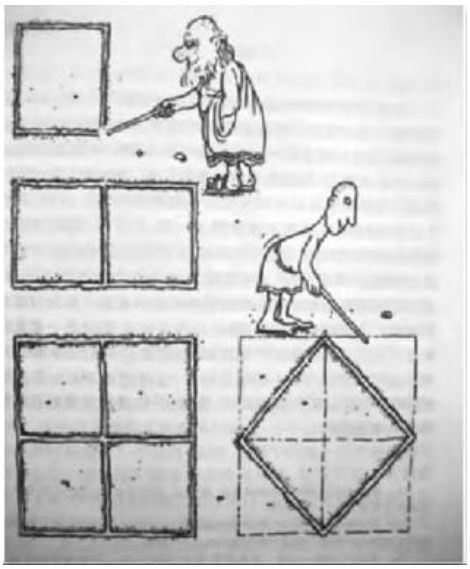

Figure 1: Prof. Socrates Geometric

This historical mathematical story enables us to avoid introducing unreasonable numbers using the hooking theorem, a small story that Socrates teaches geometrical is interesting and philosophical and easy to stimulate students' interest in learning. The slave child in the story can come up with an answer to a mathematical problem under the guidance of Socrates without any knowledge reserves, so students are encouraged to inspire their self-confidence in learning mathematics and to play a role in moral education in the discipline.

Summary and Reflection

Teachers should meet the principle of a unity of historical order, logical order and psychological order when using the introduction of mathematical history, choose mathematical history materials that conform to the level of students' cognitive development, and reconstruct the historical situation suitable for classroom teaching by teachers to achieve a favorable introduction effect. Mathematics teaching from the perspective of mathematics history has six values: revealing the harmony of knowledge, presenting the beauty of methods, creating the joy of inquiry, helping to achieve ability, displaying the charm of culture and realizing the effect of moral education [6]**.** Nevertheless, importing new knowledge in the history of mathematics is not universal, and a lot of mathematical knowledge is not introduced with a suitable history of mathematics. Hence, when importing new knowledge with mathematical history, teachers should not use mathematical history for the sake of mathematical history but use mathematical history to stimulate students' interest and create a situation that is more conducive to their knowledge generation, together with other ways of import, so that mathematical history can play a positive role in the introduction of new knowledge.

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