Integration of Mathematics History and Mathematics Education

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Abstract: The relationship between mathematics history and mathematics education is an important issue in history. There are similar subjects in many research fields, but the research characteristics and laws are different. The history of mathematics reflects a process in which people gradually understand mathematics in the field of thinking. However, mathematics education is a process of showing people's learning of mathematics as a curriculum system. There is a long history of development and a distinctive feature of the times. . This paper studies and analyzes the domestic and international background and practical significance of mathematics history, in order to present the specific way of integrating mathematics history and mathematics education.

1. Introduction

In 2001, the "Full-time Compulsory Education Mathematics Curriculum Standards (Experimental Draft)" promulgated by the Ministry of Education emphasized the "introduction of relevant mathematical background knowledge" in the textbook preparation recommendations for the three semester. In the foreword of the "Standards of General Senior High School Mathematics Curriculum (Experiment)" issued by the Ministry of Education in 2003, Article 8 of the "Basic Concepts of the Curriculum" "reflects the cultural value of mathematics", pointing out: "Mathematics is an important part of human culture. Mathematics courses The history, application and development trends of mathematics should be properly reflected, the role of mathematics in promoting social development, the social needs of mathematics, the promotion of social development on the development of mathematics, the ideological system of mathematics, the aesthetic value of mathematics, and the innovative spirit of mathematicians. The mathematics curriculum should help students understand the role of mathematics in the development of human civilization and gradually form a correct view of mathematics. To this end, the high school mathematics curriculum advocates the cultural value of mathematics and proposes the study of 'mathematical culture' in appropriate content. Request, set up a topic such as "Mathematical History Selection". This fully reflects the importance of mathematics curriculum reform on the role and value of mathematics history in mathematics education, and also makes the integration of mathematics history and mathematics education an important topic in mathematics education research. In view of this, this paper will systematically discuss the research on the integration of mathematics history and mathematics education from the theoretical level.

2. The concept of integration

Since the 1980s, the Chinese mainland scientific community and the philosophical community have consistently applied the term "integration" to the translation of the English and American scientific and philosophical terms "integratio n". Huang Yuquan of South China Normal University believes that the so-called integration, which involves the students, content and other elements of the school teaching system at the macro level, also involves the cognition, emotions, skills, needs, interests, wills, and various series of knowledge. Scholar Huang Hongwei explained the concept of “integration“ from a philosophical perspective. He summarized the basic meaning of integration as follows: First, integration refers to the process in which the core of a system or a system links together several parts and elements to make it a unified whole. Second, the driving force of integration is new. Before the formation of a unified system or system core before the formation of

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a unified role. In short, integration is the overall integration of the whole. Based on this, the integration of mathematics history and mathematics education means that under the help of the history of mathematics, the mathematics and history in mathematics education are integrated under the interaction, constantly interacting, mutual interaction, dynamic integration . "Integration" is to make better use of history, to make mathematics teaching develop more systematically and comprehensively, and to study mathematics education in a broader historical, social, scientific and cultural perspective.

3. The practical significance of the integration of mathematics history and mathematics education

As the saying goes, "Interest is the best teacher." In the process of mathematics learning, the initiative and enthusiasm of students come from their interest in learning. Integrate the history of mathematics in mathematics education, draw students' attention with stories, and let them generate interest to solve problems. In this way, students also mastered mathematics in the process of understanding the history of mathematics. After the students' interest is stimulated, the students' initiative and enthusiasm will also improve, and the efficiency and quality of learning will also improve when learning mathematics.

Mathematical teaching is to let students better understand mathematical concepts, learn mathematical methods, and comprehend mathematical ideas. However, because mathematics is too formal and Abstract in learning, the forms of mathematical concepts, methods, and ideas are also Abstract. However, if the mathematical concepts are gradually evolved from the perspective of historical development, the historical process and content of mathematics development will be revealed, and the mathematical knowledge will be dissected along the rigorous and meticulous thinking process of mathematicians. In this way, through the integration of mathematics history and mathematics education, combined with the teaching content, will be linked to each other, can help students to profoundly understand mathematical concepts and mathematical ideas, grasp the development of mathematics, and gradually understand the mathematical knowledge in essence.

Mr. Li Wenlin once said that different people in different time and space and cultural backgrounds have different solutions when dealing with the same problem. By showing these different models, it is possible to truly show how mathematicians have created one mathematical truth after another. Let students feel the real and fresh thinking process, understand where the mathematics problem comes from, understand its Abstract and formal background, and cultivate creative thinking ability and thinking mode in long-term learning and thinking and exploration in order to broaden students. The vision of developing students' potential and improving students' mathematical imagination.

4. The best combination of mathematics history and mathematics education integration and suggestions

The mathematical method of thinking is the best combination of the integration of mathematics history and mathematics education. The mathematical thinking method is an essential understanding of the content of mathematical knowledge and the methods used. It is embodied in specific content and methods, and has been refined and summarized to become rational knowledge and directly govern the practical activities of mathematics teaching. The mastery of mathematical concepts, the establishment of mathematical theory and the application of solving methods are all examples of the application and application of mathematical thinking methods. First of all, the history of mathematics is the development history of mathematical thought methods. The development of mathematical thought methods is the main line running through the history of mathematics. The history of mathematics describes how mathematical concepts such as numbers, functions, curves, spaces, limits, differentials, integrals, sets, correspondences, groups, rings, and domains are developed from vivid to Abstract, from thinking to practice. Deeply reflect the history of nature. The history of mathematics reveals a series of important mathematical theorems, the processes of

mathematical methods, and the origins of the development of new branches of mathematics, especially the examples of creative thinking of mathematics masters. From another point of view, in the long history of mathematics development, important mathematical ideas have been born with every major mathematical discovery. Every step of mathematics is the struggle, break and inheritance of new mathematical ideas against traditional ideas. Second, mastering mathematical thinking methods is the key to mathematics education. The ultimate goal of mathematics education is to cultivate students' mathematical ability and mathematical thinking. Mathematical ability and mathematical thinking are mainly formed by mastering mathematics knowledge and using mathematical thinking methods flexibly. Mathematical thinking methods play a very important role in students' learning. As the essence of mathematics knowledge, mathematical thought method is the understanding of the essence of mathematics, a guiding ideology of mathematics learning and a universal adaptation method. It is a high-level summary and Abstraction of mathematical objects and mathematical knowledge, and is a form of meta-knowledge. It exists in harmony with the knowledge of mathematics and is expressed through the manifestation of mathematical knowledge. It acts on human thinking in a subtle form, not only can organically combine the learning and cultivating skills of mathematics, but also improve the individual's thinking quality and mathematics ability, thus developing students' intellectual and mathematical literacy. As the mathematician Yan Shijian pointed out: It is an important task of basic mathematics education to explain the development path of mathematics and the development and development of mathematics to students in a lively and active way.

In the past few decades, many researchers have conducted extensive discussions on the integration of mathematics history and mathematics education. Among the most influential is the History of Mathematics Education: the ICMIStudy (Do rdrecht: 2000), edited by former HPM President John Fau vel and scholar Janvan Maanen in 2000. Kluw er, 2000)). This book was written on the basis of a large number of HPM papers, which are broadly divided into two categories: 1) "empirical" articles. It mainly describes the use of mathematics history and the evidence of student response in mathematics education at all levels; 2) "Theoretical" article. There are philosophical research, scientific research, and evaluations on the use or integration of history in mathematics education. It is precisely because of the publication of this book that the study of the integration of mathematics history and mathematics education has received more and more attention, including many front-line mathematics teachers have shown great interest in this research topic. This fact shows that the integration of mathematics history and mathematics education is a historical necessity. Taking the history of mathematics as the starting point for improving the level of mathematics education, it can be said that the pulse of mathematics education has been cut, and the key to mathematics education has been cut. However, the history of mathematics cannot automatically inspire mathematics education. The role of mathematics in mathematics education is the key to the combination of mathematics history and mathematics education. How to deal with this role has always been a hot issue in the international HPM team. With the in-depth development of HPM research, the history of mathematics for mathematics education needs to move from theory to practice. The academic session has also increasingly focused on the elaboration of specific methods of the integration of mathematics history and mathematics education and the acquisition of actual evidence of the role of mathematics history in mathematics education. That is, how to apply the cultural value and method of mathematics history to teaching practice. In the past, it was generally believed that the study of mathematics history was an elegant, sunny and white snow-like model. Even if no one had read it for many years, mathematic historians were still complacent and intoxicated in the work of forgetting me. However, in today's era, mathematics teaching is no longer simply the transfer of knowledge and skills. It pays more attention to the cultivation of ideological methods and emotional attitudes and values. The history of mathematics has thus got rid of the situation that it has been left unattended, and it has gradually been valued by educational researchers and the majority of front-line teachers. So the history of mathematics was invited into the classroom as part of the classroom culture as a source of knowledge generation and development. However, because mathematics historians do not understand mathematics teaching,

and mathematics educators and front-line teachers do not understand the history of mathematics, the integration between them has produced discordant notes. Therefore, the author believes that the urgent task of the integration of mathematics history and mathematics education is to train a group of scholars who are both proficient in mathematics and proficient in mathematics education. In addition, the mathematical history research of mathematics education orientation, the teaching design based on mathematics history, the empirical research on similarity, the application of mathematics history knowledge in classroom teaching experiments and the design and writing of infiltration mathematics history will be the current and future research of HPM.

5. Conclusion

The integration of mathematics history and mathematics education, while making better use of mathematics history knowledge, also promotes the development of mathematics education in a more scientific and comprehensive way, and examines mathematics education from a more scientific historical perspective. Therefore, "integration" conforms to historical development. The ineviTable requirement has caught the direction of mathematics education. However, in the specific teaching implementation process, there are still many problems. Only when theory and practice are combined to solve these potential problems can we better integrate mathematics history and mathematics education and promote its harmonious development.

References

[1] Gu Si. Research on the integration of mathematics history and mathematics education [J]. Urban Geography, 2015, (8): 202-202.

[2] Wang Wei. On the Significance and Principles of the Integration of Mathematics History and Secondary Vocational Mathematics Education [J]. New Curriculum, 2013, (1):211.

[3] Xia Tifei. Analysis of the Status Quo of Mathematical Teaching and Mathematical History Integration in Junior Middle School [J]. Education Research and Practice, 2015, (7):198-198.

[4] Huang Weiquan. The development trend of foreign curriculum integration and its enlightenment [J]. Comparative Education Research, 1997, (3): 38-41.

[5] Huang Hongwei. The concept of integration and its philosophical implication [J]. Academic Monthly, 1995, (9): 12 -17.