

Research on the Educational Path of Mathematics History for College Students Based on the Cultivation of Core Literacy

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Keywords: History of Mathematics; Educational Reform; Core Quality

Abstract: As a course, the history of mathematics has been listed as a part of the professional curriculum system by more and more colleges and universities in China. To realize the all-round development of human beings, we should explore ways to cultivate students' learning ability, carry out quality education and cultivate their learning accomplishment to the present "core accomplishment". It not only marks the achievements of educational reform in different stages, but also reflects the process of continual integration of China's education with other countries in the world from theoretical research to reform practice. Based on the study of the curriculum setting, the value of curriculum objectives, the selection of curriculum contents and the history of development of mathematics history in Chinese universities, this paper puts forward the idea of mathematics culture as the foundation and the cultivation of rational spirit. The presentation of core literacy goals highlights the key competencies and personality developments that result from acquiring knowledge. It will also prompt us to think about how to define the objectives of the teacher education curriculum based on core literacy, how to construct the curriculum system, how to choose the teaching content and methods, and how to improve the evaluation methods.

1. Introduction

As a course, the history of mathematics has been listed as a part of the professional curriculum system by more and more colleges and universities in China. It also reflects the role of social development in promoting the development of mathematics [1]. Although the history of mathematics has clear requirements in the curriculum standards and textbooks of mathematics, it has hardly been integrated into the actual classroom teaching. That is, there is a phenomenon of "high evaluation, low application" and separation between theoretical level and practical operation level [2]. At present, it is a necessary way to study the education reform based on core literacy to carry out the fundamental task of cultivating people by virtue. The phenomenon of "high evaluation and low application" in the history of mathematics education in middle schools is mainly due to the "congenital deficiency" and "acquired deficiency" of middle school teachers' education level in the history of mathematics, as well as the poor integration of the history of mathematics into teaching materials [3]. To achieve "all-round development of people", explore ways to train students' learning ability, promote quality education and develop learning literacy to cultivate "core literacy". It is not only the result mark of education reform at all stages, but also the process of continuous integration of China's education with the world's countries from theoretical research to reform practice [4].

The application of mathematics history in practical teaching is not satisfactory. Except for a very small number of teachers who can apply mathematics history, most teachers rarely use it. In particular, the high school mathematics elective series 3 course containing the history of mathematics has hardly been opened [5]. To change the above situation, the key should be to strengthen the education and training of pre-service and post-vocational mathematics history of middle school teachers, adopt the teaching method of occurrence, integrate mathematics history into classroom teaching, and improve students' academic performance. Mathematical educators are also relentlessly exploring the educational function of the history of mathematics, making it a course that can be "applied" [6]. In teaching, we should introduce some historical events and figures which

play an important role in the development of mathematics in the light of the content of senior high school mathematics curriculum as far as possible [7]. It reflects the role of mathematics in the progress of human society and the construction of human civilization. Based on the study of the curriculum setting, the value of curriculum objectives, the selection of curriculum contents and the history of development of mathematics history in Chinese universities, this paper puts forward the idea of mathematics culture as the basis, and emphasizes the cultivation of rational spirit [8]. Choose the teaching content according to the course of mathematics mentality and construct the course of mathematics history. Give full play to the "general education" function of mathematics history course.

2. Materials and Methods

At the same time of the history of mathematics, "high evaluation, low application", teachers are accustomed to spending time on students mastering problem-solving skills, skills, and rote memorization. As everyone knows, as the content of learning deepens and the difficulty of learning increases, more and more students are caught in the situation of "knowing it, not knowing why." More and more people are losing interest in mathematics. Looking back at the history of the development of mathematics history education in colleges and universities, we can see that its development and trajectory in curriculum setting is: from the history of mathematics course to the course of natural dialectics, and then to the current mathematical culture. The requirements of the curriculum standards for mathematics education have not been lowered, but have been raised, and the requirements for cultivating students' innovative ability have been put forward [9]. Innovation is based on solid foundation. Mathematics achievement reflects students' mastery of mathematics foundation to a great extent.

On the radiation surface of educational objects, students majoring in mathematics have developed into students majoring in science, engineering and philosophy. Then from science and engineering and philosophy students to all college students. It fully embodies the purpose of promoting quality education in an all-round way, improving national quality and cultivating innovative talents. We have established the idea of promoting educational reform by scientific research and management. Determine and calculate test statistics. In the hypothesis test of two independent sample ratios, the statistical data used are as follows:

$$\frac{d^2 \omega}{dx^2} - \frac{h}{\alpha^2 EI_0} \frac{d\tau}{dx} = -\frac{M}{EI_\infty} \quad (1)$$

Can be exported:

$$\frac{d^2 \tau}{dx^2} - \alpha^2 \tau = -\frac{\alpha^2}{h} \left[1 - \frac{EI_0}{EI_\infty} \right] V \quad (2)$$

Different external tags depend on the data stream. Implement business transfer:

$$\phi_{ij} = \frac{1}{N_c} \sum_{i \in N_c} n_i n_j \quad (3)$$

At the same time, the course of mathematics history has different goal orientations, from a single "emotional goal" value orientation to a two-dimensional "emotional goal" and "knowledge goal" value orientation, and then to a three-dimensional "humanistic goal." "Emotional goals" and "intellectual goals" value orientation. Lack of interest in mathematics learning and lack of confidence in the ability to learn mathematics is one of the important reasons for the poor mathematics of middle school students. How teachers use teaching materials and how to reasonably inspire students' interest in mathematics learning is a key factor. "Everyone can learn" good mathematics, it is necessary to improve students' interest in mathematics learning. Once students form an interest in learning mathematics, they will firmly remember mathematics knowledge [10].

At the same time, it produces pleasant, satisfying and joyful learning emotional attitudes. When setting the curriculum goal of history of mathematics, we should really realize that "mathematics is a kind of spirit, a kind of rational spirit, and it is this spirit that enables human thinking to be applied to the most perfect degree." The Chinese nation needs to inject rational spirit into its culture, and the curriculum of mathematical history needs to undertake the important task of cultivating rational spirit. In order to cultivate people who pay attention to empirical experience, logical reasoning, quantitative analysis, truth-seeking scientific attitude, frank, Frank style and independent spirit.

3. Result Analysis and Discussion

Exploring the course of mathematics mind is the basis of choosing the content of mathematics history course. As a course of history of mathematics in Colleges and universities, its content should be chosen not only according to the teaching purpose and teaching requirements of the course, but also from the perspective of the cultural view of mathematics science, to analyze the theory of the historical and cultural background of the generation, development and improvement of mathematics. It embodies the origin, motive force and cultural value of the development of mathematics. The new curriculum requires teachers to teach "to show the process of knowledge occurrence, development, formation and application, to strengthen mathematics learning activities, to provide students with personal experience and opportunities". As the content and requirement of the new textbook for the history of mathematics are obviously enhanced, it is necessary to improve the education level of the existing middle school mathematics teachers in the history of mathematics. To train them in this respect, a large number of teachers of the history of mathematics specialty are needed, but this requirement cannot be met at present. The history of mathematics is an important carrier of mathematical culture, and the appropriate concept of mathematical culture contributes to the proper positioning of the course of mathematics history. The concept of mathematical culture takes a broader and broad theoretical perspective on various issues related to the development of mathematical history. Again, the methods available to middle school teachers to incorporate mathematics into teaching and related references are few and not systematic and imperfect.

A simple and effective way to analyze the difference between core literacy training and vocational skills training is the hypothesis testing of two independent sample methods. A university teaches the same class in three classes at the same time. In the student assessment, the teacher's assessment data is shown in the table.

Table 1 Student evaluation data of two independent sample means

Sample size	The average score	Sample standard deviation
68	83	4.8
62	75	4.2
59	82	5.1

Mathematical culture not only adopts the internal perspective of mathematics, but also is an external perspective of culture. It analyzes and analyzes the essence of mathematics, the characteristics of mathematics and the law of mathematical development, and the relationship between mathematics and other human culture creation. The status and role of human beings in the overall culture. In the specific teaching, according to different professions, different characteristics, interests and learning requirements of each student, a teaching model suitable for student development should be constructed. The pedagogy advocates that only when the subject generates enough motivation, or only at an appropriate time for the subject's psychological development, begins to let them learn a topic. That is to say, when the subject is faced with some problems that cannot be solved with the existing knowledge and feels the necessity of learning new methods or theories, the teacher begins to teach such new methods or theories. From the perspective of mathematical culture, the curriculum of mathematical history should be positioned as not only a vivid description of the evolution of mathematics, but also a vertical manifestation of mathematics

culture and sociality. Enhance the sense of situation and history of mathematical knowledge, and present fresh and vital mathematical knowledge.

4. Conclusion

It is an important task and a systematic project to integrate the history of mathematics into the daily classroom teaching and build up the history of mathematics as a bridge to improve middle school students' mathematics academic performance. To adapt to the change of the curriculum objective of cultivating students' core literacy is a new challenge brought to us by the new round of curriculum reform. Open-minded to meet the modern mathematics from the traditional humanities to adapt to the era of technology tools and logical language algorithm integration of the computer age. The proposition of the core literacy goal, changing the curriculum to attach too much importance to the imparting of knowledge, highlighting the key ability and personality development formed after acquiring knowledge, will certainly promote the further development of basic education curriculum reform. It will also prompt us to think about how to define the objectives of the teacher education curriculum based on core literacy, how to construct the curriculum system, how to choose the teaching content and methods, and how to improve the evaluation methods. In this way, in the combination of humanity, affectiveness, knowledge, and rational value goals, mathematics is used to cultivate the spirit of mathematics, to inspire personality growth, and to foresee cognitive development. Thereby promoting students' understanding of mathematics and understanding of mathematical values, and building a bridge between mathematics and rationality.

Acknowledgement

Teaching Reform Program of Shaanxi Xueqian Normal University (17JG024Y).

The 13th Five-year Plan of Education Science in Shaanxi Province (SGH17H307).

References

- [1] Alpaslan M, Mine Işıksal, Çiğdem Haser. Pre-service Mathematics Teachers' Knowledge of History of Mathematics and Their Attitudes and Beliefs towards Using History of Mathematics in Mathematics Education [J]. *Science & Education*, 2014, 23(1):159-183.
- [2] Mosvold R, Jakobsen A, Jankvist U T. How Mathematical Knowledge for Teaching May Profit from the Study of History of Mathematics [J]. *Science & Education*, 2014, 23(1):47-60.
- [3] Povey H. 'Walking in a Foreign and Unknown Landscape': Studying the History of Mathematics in Initial Teacher Education [J]. *Science & Education*, 2014, 23(1):143-157.
- [4] Kjeldsen T, Petersen P. Bridging History of the Concept of Function with Learning of Mathematics: Students' Meta-Discursive Rules, Concept Formation and Historical awareness [J]. *Science & Education*, 2014, 23(1):29-45.
- [5] Fenaroli G, Furinghetti F, Somaglia A. Rethinking Mathematical Concepts with the Lens of the History of Mathematics: An Experiment with Prospective Secondary Teachers [J]. *Science & Education*, 2014, 23(1):185-203.
- [6] Lambert K. A Natural History of Mathematics: George Peacock and the Making of English Algebra [J]. *Isis*, 2013, 104(2):278-302.
- [7] Katz V, Jankvist U, Fried M, et al. Special Issue on History and Philosophy of Mathematics in Mathematics Education [J]. *Science & Education*, 2014, 23(1):1-6.
- [8] Rowe D E. History Quiz: Who Linked Hegel's Philosophy with the History of Mathematics? [J]. *Mathematical Intelligencer*, 2013, 35(1):38-41.
- [9] Wang X Q, Qi C Y, Wang K. A Categorization Model for Educational Values of the History of Mathematics: An Empirical Study [J]. *Science & Education*, 2017, 26(2):1029-1052.

[10] Kurrer, Karl-Eugen. Bücher: The History of Theoretical, Material and Computational Mechanics - Mathematics meets Mechanics and Engineering [J]. Beton- und Stahlbetonbau, 2014, 109(5):371-372.