The Studies on Curriculum of Mathematics Major in Chinese Normal Universities

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Abstract

At present, China is carrying out a new round of basic education curriculum reform, which requires teachers to have higher teaching ability. This will inevitably promote the reform of normal education, and the curriculum set is the core issue of normal education. In order to respond to the new curriculum reform, promote normal education. The development of normal universities should make corresponding changes to the curriculum. This paper takes the curriculum setting of mathematics major in normal universities as the research object, and uses the literature method to make a simple combing of the research in the past ten years. It focuses on the analysis of problems and solutions in mathematics curriculum setting in normal universities. It shows that the problems in the curriculum setting of mathematics majors in normal colleges and universities are: small proportion of mathematics education courses, severe disjunction between higher mathematics and intermediate mathematics, less attention to the teaching of "mathematics curriculum standards", less teaching skills training courses, and attach importance to theory and despise practice, lack of integration of curriculum content, few humanities and social courses, etc. The corresponding solutions include: increasing the proportion of mathematics education courses, increasing teaching skills training courses, making the "Mathematics Curriculum Standard" a compulsory course, increase the time for educational internships, diversify elective courses, and offer postgraduate courses.

1. Introduction

The new curriculum reform of basic education requires teachers to have higher professional competence, while normal colleges and universities are fertile ground for cultivating teachers for basic education. Because the quality of normal education directly affects the development of national education, and good normal education can not only effectively promote the reform and development of basic education in China, but also the basic guarantee for comprehensively promoting quality education. Curriculum setting is the core issue of normal education. Therefore, in order to reform the teacher education of mathematics specialty in normal colleges and universities, we must first adjust the

mathematics curriculum. In the past 10 years, many scholars have made corresponding research on the curriculum setting of mathematics majors in normal colleges and universities. Most of the studies have disclosed the problems existing in the curriculum setting of mathematics, and have proposed a series of ideas for reforming the curriculum setting of mathematics. This article is mainly a summary study of the curriculum setting of mathematics education majors in normal universities.

Because the curriculum should change with the changes in the new curriculum reform, it must be of an era. This article mainly analyzes articles in the past 10 years, and finds that the previous research basically involves the following aspects: the necessity of reforming the curriculum system, the problems in

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the curriculum setting of mathematics education in normal universities, and the principles that mathematics education curriculum should follow, the predecessors put forward their own ideas for the lack of curriculum.

2. The Necessity of Setting up a Reasonable Curriculum System

Reasonable curriculum can help mathematics normal students to learn systematically and master teaching skills. It is something that every normal college should pay attention to. Hu Ailian and Deng Yong believed that with the continuous increase of society's requirements for teacher professionalization and the continuous development of teacher professionalization, how to improve the curriculum of teacher education to adapt to the trend of professionalization has become a universal concern [1]. Que Jianhua pointed out that the structure and setting of the curriculum system of mathematics education majors in teachers' colleges are now increasingly exposed. This structure and setting out of the social system has gradually derailed students. Therefore, it is urgent to deepen the reform of the curriculum system and set a reasonable curriculum structure things [2]. Zhang Shoubo and Zhu Chengke also mentioned that the core of teacher education reform is the issue of teacher specialization. The overall reform of mathematics education curriculum in normal colleges should pay close attention to the reform of mathematics curriculum in basic education in China and the professionalization of teacher education worldwide [3]. In short, a new round of basic education reform has begun, and normal colleges and universities should also respond.

3. Curriculum of Mathematics Education Major in Normal Universities

The status quo of the traditional mathematics curriculum in China's normal colleges and universities is that freshmen and sophomores are studying professional courses in mathematics, juniors are studying mathematics education courses, and seniors are mainly engaged in educational internships. Wu Guangxian and Fan Zhiyong pointed out that the curriculum of mathematics major in normal colleges is poor, the subject curriculum places too much emphasis on the theory and system of knowledge, and the connection between normal college teaching materials and middle school teaching materials is weak [4]. Zhang Rongxi learned that the structure of mathematics education courses is aging, the content is relatively old, and there are too few elective courses. The

proportion of education courses in the overall curriculum system is not high, and the degree of attention needs to be improved [5]. Zhang Feiran and Wang Wei believed that the curriculum setting of mathematics major in normal colleges and universities attaches great importance to the depth of contempt for breadth, lacks comprehensiveness, and is severely disconnected from the actual teaching needs of primary and secondary schools, and the timeliness is not good [6]. Liang Hongliang pointed out that there are also many problems in the setting of mathematics courses in local normal colleges and universities. For example, the structure of mathematics education courses is aging and cannot keep up with the times. There are few related subject settings and the emphasis is on theory and practice. Insufficient attention is given to the training of mathematics teachers' education skills [7]. Liu Xingdong and Zhang Zhanliang pointed out that the proportion of major courses in mathematics majors in normal universities is too large, and the proportion of other courses such as pedagogy and psychology is too small, accounting for only about 7%, and the curriculum setting places too much emphasis on the logic of the curriculum system and completeness, the way of thinking and development of mathematical thinking and mathematical knowledge is ignored [8]. Mei Songzhu and Leng Ping pointed out some manifestations of the current incomplete mathematics education curriculum. The first is an overemphasis on the discipline standard, centered on the mathematics curriculum, while the mathematics education courses are like decorations, and the second is that the disciplines are too finely divided. There is a lack of necessary integration and streamlining between the various branches of the class, and finally the curriculum content overlaps and annoys students [9]. Gao Junyu, Yang Li and Yu Rongge believed that basic courses are too much emphasis on serving professional courses, and courses that are not directly related to professional courses are less or even not offered. For example, courses such as university language and university chemistry are basically not offered to students in mathematics. In addition to politics courses, humanities courses such as history, geography, and art are basically not offered, and some mathematics teaching technology courses are mostly in the form [10]. The problems in these curriculum settings are not only in the higher normal colleges and universities in the Han nationality area. Due to the relatively backward teaching conditions, teaching environment, and teaching staff in minority areas, the problems of the higher normal college curriculum settings are even more serious. Wei Lanying pointed out that the mathematics curriculum in ethnic areas points to a wide range of mathematics majors, outdated content, and serious disconnection from elementary mathematics, less mathematics education courses, lack of pertinence, more compulsory courses and fewer elective courses, too much

emphasis on mathematics majors and ignored humanities [11]. Many students hope to be admitted to postgraduate studies after graduating from undergraduate. At present, normal colleges and universities rarely set up corresponding courses on postgraduate research. Huang Yonghui, Wang Jun, Yuan Chengjun believed that the current problem of mathematics education majors in normal colleges and universities is that the curriculum system is relatively single, and the modular curriculum is weak, which can no longer meet the needs of the times. Postgraduate students cannot implement targeted teaching [12].

4. Principles of Setting up a Reasonable Curriculum System

Xie Fang emphasized that the setting of the curriculum system should take into account the new ideas and concepts of education reform, target students' development needs, adapt to the needs of social development, and incorporate moral education materials into educational knowledge [13]. He Shuying believed that the curriculum should follow the following principles: one is to reflect individuality and not to be unified, and it should be broadened in the curriculum, the other is to emphasize the key points and take into account the general. It is necessary to emphasize and attach importance to the main basic courses and other. Third, the mathematics courses are divided into different levels, which are set according to their aptitude, and the courses are selected according to the students' intention after graduation [14]. Li Jianhua and Kang Shugui believed that to ensure the basic and cutting-edge nature of the mathematics curriculum content, to promote the transition of knowledge from an academic state to an educational state, to facilitate the integration and penetration of the content of mathematics curriculum, and to promote the development of students' mathematical literacy [15]. Liu Xiaohui emphasized that the curriculum reform should be combined with four principles: the combination of knowledge and ability, the combination of application and innovation, the combination of university and middle school, and the combination of theory and practice [16]. In short, when setting up a course, we must follow the people-oriented concept.

5. The Idea of Setting up a Reasonable Curriculum System

How to set up a reasonable curriculum system to meet the standards of mathematics curriculum and keep up with the times, so that normal colleges and universities can train good

teachers, which has long been a subject of extensive research. Many scholars have given their own ideas on the setting of mathematics curriculum. Duan Zhigui divided China's normal universities into three categories. As for the first type of normal universities, elective courses such as mathematics education psychology, mathematics learning theory, and education evaluation should be added. Courses to ensure that interested students can conduct more in-depth research. For the second type of universities, the number of elective courses for teacher education courses should be increased to provide students with a variety of course options. For the third type of colleges and universities, we must ensure the establishment of basic courses in subject teaching and strengthen the teaching of middle school mathematics textbook analysis, mathematics teaching case analysis, and mathematics teaching design [17]. Wang Jun, Li Yunhui, and Jiang Xiuying emphasized that in order to train professional talents in basic mathematics and applied mathematics, as well as to train qualified middle school teachers, they proposed the construction of "mathematics foundation construction in normal colleges", "mathematics platform construction in normal colleges", and "mathematics orientation in normal colleges", the concept of "three-in-one construction" as a whole, with the direction of the lead and the purpose of promoting development through modules, to realize the new model of the "three-in-one" undergraduate curriculum system for mathematics majors in normal universities [18]. Zhang Yuewei believed that teaching mathematics education software courses is conducive to the current professional learning of normal students and to the future work of normal students. Therefore, mathematics education software courses are essential [19]. Bi Xiuzhi, Fang Haiwen and Li Chunling suggested that mathematics education courses in teachers' colleges should be set up as a four-stage curriculum design and four-step teaching training, education theory courses and blackboard writing training courses in freshman, and mathematics textbook analysis courses and language in middle school sophomore. Explain skills training courses, set up middle school mathematics thinking method courses and mathematics micro-teaching simulation training courses in junior year, and set up lesson preparation, speaking, lecture, evaluation and courseware production in senior year, and strengthen practical training in simulated classroom, and strengthen simulation classroom practice training [20]. Li Tanghai, Chen Xue, proposed the following ideas for the proportion design of various disciplines: mathematics education accounts for 28%, public education accounts for 12%, advanced mathematics accounts for 40%, and general culture Classes account for 20% [21]. Wang Huiling, Wang Haikun, Zhu Zhu suggested increasing the content of new middle school mathematics curriculum standards such as elementary number theory, spherical geometry, Boolean algebra, etc., increasing the number of

hours of elementary mathematics research courses, and strengthening the teaching of middle school mathematics teaching methods [22]. Hu Guiying, Huang Chuanjun and Zhong Junping attached great importance to the educational value of the history of mathematics, and advocated the integrated thinking of courses such as "History of Mathematics", "Introduction to Mathematics Pedagogy", and "Mathematics Teaching Methods" from the point of meeting the needs of the new high school mathematics curriculum standards. Thinking, using the history of mathematics to promote the professional growth of students [23]. Li Yanqin believed that the mathematics specialty of normal colleges should cover the content of middle school mathematics, and deepen and expand it. There should be few and fine basic courses, wide and deep professional courses, diversified elective courses, and high-quality education courses [24]. Through empirical analysis, Yang Xiaobin, Deng Peng and Li Ling found that more than 65% of undergraduates and mathematics teachers considered it necessary to study or set up "Mathematics Pedagogy" and "Mathematics Educational Psychology" as optional courses [25]. Zeng Youliang conceived that the professional courses of mathematics education in normal colleges are divided into three major categories: advanced mathematics, public education, and mathematics education. The proportion of each course is designed as follows: general cultural courses account for 20%, and advanced mathematics courses account for 40%, Public education accounts for 12%, mathematics education accounts for 28% [26].

6. Summary of Existing Research

In terms of the necessity of the curriculum setting of mathematics education in normal universities, the predecessors generally believed that the reform and development of normal education occupies an important position in China's overall education reform and development, and the curriculum setting is the core issue of normal education, therefore, to reform teacher education, we must first reform the curriculum.

As far as the problems in the curriculum setting of mathematics education in normal colleges and universities are concerned, previous studies can be summarized as follows: 1. There are more mathematics courses, but less mathematics education courses, less class hours, and less knowledge keep up with the times. 2. The correlation between higher mathematics and elementary mathematics is not high, and it is severely disconnected from middle school education. Many people think that the quality of mathematics courses in universities will not affect the teaching of middle school

mathematics at all. 3. The knowledge update is not timely enough to effectively respond to the reform of the mathematics curriculum, and the school does not attach importance to the study of the "mathematics curriculum standards". 4. There are too few teaching skills training courses, and they are more formal. The school emphasizes theory but not practice, and the cycle of educational practice is too short. 5. The content of the curriculum is complicated and repetitive. For example, certain knowledge points of pure education are repeatedly appearing in the curriculum of mathematics education, which lacks the necessary integration. 6. Humanities and social courses such as history and geography, which are not directly related to mathematics, are basically not offered, which also limits the comprehensive development of normal teachers of mathematics.

In terms of the principles of reasonable curriculum, the predecessors emphasized that based on the needs of student development, diversified curriculum choices, the combination of theory and practice, the integration of universities and middle schools, and the infiltration of curriculum content into moral education.

In terms of a reasonable curriculum, the main point of view of the predecessors is to increase the proportion of mathematics education courses and increase the number of courses. Schools should pay more attention to education courses. "Mathematics Curriculum Standards" and "Mathematics Educational Psychology" should open or even include compulsory courses, change the previous course distribution, so that each academic year has theoretical skills training courses, increase the time of educational practice, and elective courses should give students as many opportunities as possible, postgraduate courses for students' needs.

Predecessor research has basically raised the existing problems in the curriculum. Some researches are based on actual date, so they have certain authenticity and universality, and the proposed ideas have certain rationality. However, Some studies are not in-depth, and there are still gaps: First, how to increase the number of educational courses without changing the total number of hours. The variety of courses will inevitably cause boredom and reduce the interest of students, so how to balance the contradiction between students' psychology and many courses has also become an issue that must be considered. Secondly, predecessors thought that the postgraduate course can be set according to the needs of students. However, different schools have different postgraduate subjects and exam content, and there are many ways to choose, so how to set up the postgraduate course, from when, should include those content to be in-depth research.

7. Conclusion

Existing studies have shown that, in order to reform the normal education, the most important thing is to consider the reform of curriculum settings. As far as mathematics is concerned, the main problems existing in the curriculum of mathematics education in Chinese normal universities are as follows: the proportion of mathematics education courses is small, there is a serious disconnect between higher mathematics and intermediate mathematics, the teaching of the "mathematics curriculum standards" is not valued, and less teaching skills training courses, attach importance to theory and despise practice, less integration of curriculum content, less humanities and social courses, etc. In response to these problems, scholars have also proposed corresponding reform ideas, mainly including the following aspects: increasing the proportion of mathematics education courses, increasing teaching skills training courses, making the "Mathematics Curriculum Standard" a compulsory course, increasing the length of educational internships, the variety of elective courses, the introduction of postgraduate courses, etc. The previous studies have been basically complete and have a certain scientific nature, but there are still some in-depth studies, such as: how to increase the number of educational courses without changing the total class time, how to balance the contradiction between student psychology and many courses, and how to set up postgraduate courses according to the needs of students, etc.

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