

Views and Suggestions on the Reform of Mathematics Education and Teaching in Colleges and Universities

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Abstract: Under the situation that the teaching effect of mathematics education in Colleges and universities is poor and students' interest in mathematics is low, it is urgent for colleges and universities to implement teaching reform. However, in the process of teaching, college teachers still follow the traditional teaching mode, inculcating a large amount of knowledge for students, resulting in a gradual decline in students' interest in learning. Under this background, this paper analyses the current situation of mathematics teaching in Colleges and universities, and studies the reform contents of mathematics teaching in Colleges and universities from three aspects: teaching concept, teaching content and teaching methods. It also puts forward some suggestions on the reform of College Mathematics teaching, such as changing the traditional mode of compiling textbooks, diversifying the mode of mathematics and building a unified national mathematics curriculum standard.

1. Research background

1.1 Literature review

As a compulsory course, higher mathematics teaching mode reform has been carried out in many colleges and universities. Teachers should pay attention to the guidance of students in the teaching process. Students should also maintain a positive attitude in learning, communicate with teachers more, and explore appropriate learning methods (Zhang and Zhang, 2013). Higher mathematics textbooks should focus on cultivating students' creativity and scientific literacy. In the process of reform of higher mathematics teaching, it is important for teachers to change their teaching ideas, and students' suggestions should be heard in the process of reform of higher mathematics teaching (Feng, 2002). Higher mathematics teaching classroom is relatively boring. In the reform of mathematics education in Colleges and universities, the more popular software can be used to increase the fun of learning. It also provides students with the opportunity to understand the progress of higher mathematics reform and to have fun in high mathematics learning (Nie, 2005). Higher mathematics teaching should be clear about the teaching purpose and content, and it is better to follow the heuristic teaching mode, pay attention to the combination of modern teaching methods and blackboard writing in the course, and pay attention to the observation of students' learning adaptability (Wang, 2013). In the process of teaching reform in higher mathematics, we should pay attention to the transformation of ideas and the renewal of educational methods (Guan, 2008). According to the different characteristics of students in different schools, a targeted teaching model is formulated. Schools should listen to the suggestions of students and teachers in the process of reform according to the actual needs, and strive to improve the applicability of relevant models (Chen, 2014).

1.2 Purpose of research

Because the traditional teaching mode has been unable to adapt to the new teaching ideas and students' learning needs, the teaching materials and teaching mode of mathematics education reform need to be combined with the new teaching mode. At any time, the scientific research and professional ability of university teachers will be stronger than that of middle school teachers. However, in the aspect of teaching students, the teaching methods of some university teachers are

still relatively traditional and have not been thoroughly reformed according to the current teaching needs. By comparison, the teaching mode of middle school has been tried for more than ten years, the teaching level has been greatly improved than before, and the learning ability and effect of middle school students have also been improved to a certain extent. Therefore, colleges and universities should actively explore the dull mathematics education. In the process of reform, we should study and discuss the shortcomings of high-number teachers in the teaching process, and make in-depth analysis combined with new teaching tools. At the same time, teachers' teaching ideas also need to be highly valued. In the process of teaching, teachers should try to break the teaching mode they have been accustomed to, and make different teaching plans according to the different students. Therefore, based on the above factors, this paper analyses the current situation and reform content of mathematics teaching in Colleges and universities, and puts forward some feasible suggestions, which are of great significance.

2. Current Situation of Mathematics Teaching in Colleges and Universities

2.1 Textbook analysis

Nowadays, the textbooks of colleges and universities are not uniform. Some colleges and universities use textbooks compiled by their own schools. Ordinary colleges and universities will also choose textbooks compiled by other famous university experts. In the same course, the standards of textbooks are not the same, and there are many kinds of textbooks. However, the structure of mathematics textbooks is mostly a unified model of definitions, theorems, proofs and examples. This type of textbooks will help students to master the basic knowledge of the system, and students' thinking and reasoning ability will be greatly improved. This teaching process will improve students' learning quality, but the connection between teaching content and life is not close. When solving practical problems, the application is not obvious enough.

2.2 Analysis of teaching model

Almost all colleges and universities in China adopt the same teaching mode as those in mathematics textbooks. Whether they are mathematics majors or non-mathematics majors, they adopt such models as definitions, theorems, proofs and examples in teaching. This is not much different from the teaching mode of more than a thousand years ago. Although some people have proposed to reform the university mathematics education before, no matter what they say, they will eventually return to the traditional teaching mode.

2.3 Analysis on the malpractice of mathematics in Colleges

In the process of teaching, the traditional teaching mode is easy to make students feel tired, and is not conducive to the cultivation of innovative thinking talents. Teachers pay too much attention to students' systematic knowledge in the process of teaching practice. They write many pages of teaching plan. Theorems, proof methods and cases make teachers and students spend a lot of time to remember. But it is this process that almost makes students become a knowledge container, receiving information constantly, and there is not much room for thinking. Teachers do not innovate teaching methods in the teaching process, but simply retell the content of textbooks, which is not conducive to the cultivation of students' creativity. The continuous expansion of enrollment in Colleges and universities has also brought bad effects on mathematics teaching, and the pressure of teachers in Colleges and universities has increased. And the number of a class is increasing, from dozens of people to hundreds of people, the teaching effect is not guaranteed. Additionally, when students increase the number of teachers but not so fast, the teaching and assistant forces will be inadequate, homework corrections will be slow, and the number of corrections will gradually decrease. After the expansion of the original school enrollment, the basis of students is uneven, the number of teachers is not enough, there is no way to teach students in accordance with their aptitude, which will lead to the growing gap between students. Some colleges and universities teach only for exams. In order to let more students pass the exams, the questions are becoming simpler and

simpler year by year. This makes students form a concept of “as long as they pass the exam, it is very good” and dispels students'enthusiasm for learning.

3. Analysis on the Contents of Teaching Reform in Colleges

3.1 The change of teaching view

In traditional teaching, the first step of learning is to memorize and retell some conceptual knowledge, propositions, etc. Then begin to imitate and practice the operation mode, and then summarize and form a set of fast operation techniques which can be understood by oneself. The general teaching mode is that the teacher tells the concepts and principles, and the students practice according to their understanding and answer the relevant questions. The problem in this way is that students have been learning under the guidance of teachers, and have not stimulated the enthusiasm of students in the teaching process. Teachers should provide students with some mathematical activities in the teaching process, in order to help students explore, learn to communicate and cooperate with other students. The boring mathematics knowledge that students learn through this way will also become interesting, and the students'memory of knowledge will be more solid. Mathematics teaching should not be the traditional teacher to stuff knowledge to students, but become the mode of students'own initiative to build knowledge system. Only in this way can students become masters of mathematics learning. At the same time, teachers are also changing their roles to become a promoter of students'learning. The role of teachers should gradually change from the authority of the classroom to the guide and organizer of mathematics learning activities. Teachers should create an atmosphere of understanding and respect for students, promptly inspire and inspire students, and give reasonable guidance to students'problems. Teachers not only need to teach students mathematics knowledge, but also need to be a leader, let students master learning methods, improve students'interest in learning, cultivate students' correct attitude and emotions about mathematics learning, and incorporate some content consistent with mathematical concepts into the curriculum. In the process of mathematics teaching, flexible teaching methods should be adopted, which is conducive to giving full play to the enthusiasm and creativity of teachers in teaching. Teachers'teaching attitude will naturally have a positive impact on students.

3.2 Analysis on the change of teaching content and teaching method

3.2.1 Analysis of mathematics teaching content

Teaching content is the core of a course and the basis of interaction between teachers and students. The teaching content embodies the characteristics of popular mathematics. The content of the course emphasizes the interrelation of various fields, and points out that under the guidance of teachers, students should find, solve problems and summarize the learning methods. The main contents of mathematics curriculum are: basic mathematical thinking mode, important mathematical knowledge points and application ability that need to be mastered. It also emphasizes that students should Abstract practical problems such as life experience and personal experience into mathematical models and learn to apply them. The new content of mathematics teaching has increased the important lethality that students must master, and has also deleted some complex and incomprehensible contents which are not very useful in life.

3.2.1 Analysis on the change of mathematics teaching method

Mathematics teaching methods are mostly determined by the content and form of mathematics textbooks. Major changes in education occur every 10 years or so. After the implementation of the new curriculum standard, the teaching form is no longer only chalk and blackboard, the education industry began to change the teaching methods and educational concepts. After several years of exploration, this change has been constantly improved and summarized. Several new teaching modes have been put forward: self-study mode, discussion mode, inquiry mode and creation mode. The combination and transformation of these basic modes and their cross-presentation appear in the teaching mode. These modes can complement each other, thus creating conditions for students to

develop in an all-round way. For example, in the chapter on conceptual theorems, patterns of discovery can be used. For the general teaching content, we can increase the students' experience through some physical and animation ways to facilitate students' understanding.

4. On the Reform Proposals of Mathematics Teaching in Colleges and Universities

4.1 Changing the traditional compiling mode of textbooks

Mathematics textbooks should focus on application and process, and encourage students to discover theorems and generalize concepts on their own initiative. The content of the textbook should guide students to begin to pay attention to the relationship between subject and life on their own initiative. At present, middle school textbooks have achieved good results in this respect. College textbooks can learn from these methods, so as to provide university teachers with a more reasonable teaching program. For other disciplines immediately inside, the ideas and methods taught in mathematics textbooks can promote the learning and mastery of knowledge in these disciplines. In liberal arts teaching, the common difficulties that university teachers encounter are: students are unwilling to learn and teachers are difficult to teach. The reason is that there is no distinction between the selection of mathematics teaching content in liberal arts and traditional mathematics content. Students are laborious in learning and lack of interest. For mathematics teaching of liberal arts, we can provide some books about mathematics culture and mathematics thinking, which can not only let students understand the true charm of mathematics, but also reduce the unnecessary burden of students.

4.2 Conversion of mathematical model to diversification

Mathematics is actually the foundation of all disciplines, which is essential knowledge for citizens. Mathematics theory is rigorous and the teaching method is flexible. If only teachers explain and impart knowledge, students' mastery ability is not strong. In the process of teaching reform, different teaching methods can be chosen according to the characteristics of different teaching contents. Combine self-study method, discussion method and inquiry method.

4.3 Constructing relatively unified national mathematics curriculum standard

At present, the syllabus of each university is decided by itself, many important teaching contents have been deleted, the class hours of basic courses have been reduced, and the content of examinations has been simplified gradually. However, from the teaching results, the students' mastery level is quite different. Therefore, the state should put forward some goals and requirements for college teaching, and formulate a unified curriculum. Colleges and universities can give full play to their teaching advantages on the basis of standards and choose teaching contents with different difficulties.

4.4 Compiling guiding textbooks for national compilation

At present, it is common for colleges and universities to compile their own textbooks or adopt textbooks compiled by famous school teachers. There are also some textbooks which have been compiled by industry experts through continuous experiments. The state can also make unified compilation of textbooks by teaching-related scientific research institutions in factories. These textbooks are the starting point of teaching in Colleges and universities. If schools can make more difficult textbooks on this basis, they can also compile textbooks themselves according to the actual situation.

4.5 Improving teachers' teaching level

Teachers' teaching level is very important in the teaching process. Some teachers at the professor level and some excellent teachers have published excellent articles, not because of their teaching ability. Their way of teaching is not necessarily popular with students. And some teachers are very competent in teaching, they will focus on the improvement of teaching level, sometimes they will neglect scientific research projects. At this level, schools need to combine the characteristics of

these two types of teachers so that they can make full use of their strengths.

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