

# Research and Analysis of Stratified Teaching in Mathematics in Colleges and Universities

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**Abstract:** Stratified teaching is a relatively novel teaching method, and the rational use of the mode in mathematics teaching in colleges and universities can significantly improve students' learning effect. The knowledge characteristics of ordinary colleges and universities are slightly more comprehensive, and they also need some memory. In the course of teaching, stratified teaching can improve students' enthusiasm for learning, formulate different teaching strategies for different levels of students in the course of teaching, and help to improve students' learning quality, this paper studies the application strategy of mathematics stratified teaching mode in colleges and universities, in order to reflect the thought of student-oriented teaching activities in colleges and universities to truly achieve the teaching goal of aptitude.

## 1. Introduction

With the deepening of the new curriculum reform, the mathematics teaching materials of colleges and universities have been adjusted and revised. The content of the new textbook is more student-oriented, which conforms to the students' age characteristics and cognitive ability, which brings vitality to the mathematics teaching in colleges and universities. At the same time, higher requirements have also been put forward. The teaching of mathematics education in colleges and universities should be oriented to all students, and the traditional "one-size-fits-all" teaching mode neglects the individual differences of students, which makes most students' enthusiasm for learning not high. In view of this shortcoming, teachers should pay attention to each student in mathematics teaching, implement the mode of stratified teaching, formulate different teaching goals, attach importance to the individualized differences of each student, use different teaching methods and teaching means for different levels of students, carry out different teaching design, and truly teach according to their aptitude so as to enable every student to learn in a relaxed and free learning atmosphere, acquire knowledge and improve their abilities.

## 2. The concept of stratified teaching mode

The teaching is based on the students' knowledge, psychological characteristics, abilities and potentials, and uses scientific methods to divide students into several levels and groups similar to these aspects. In each small group, the students' learning situation is similar, it is easier to communicate and promote common development and common progress. Teachers can also give full play to the advantages of stratified teaching when teaching, and truly realize the learning characteristics of students at each level, then teaching them in accordance with their aptitude<sup>[1]</sup>.

Mathematics teaching in colleges and universities should not be based solely on inculcating knowledge, which is relatively old and traditional. The knowledge structure that has not been updated for many years may be aging, unable to keep up with the progress of society and the times, and difficult to meet the needs of quality education and new curriculum reform. Mathematics teaching should cultivate students' innovative consciousness and divergent thinking while learning book knowledge, improve students' logical thinking ability and language expression ability, so as to improve students' mathematical literacy. The application of stratified teaching can enable students to study in a learning environment suitable for their own situation, and also promote communication between students at the same level of competence. In this interactive process, students can access to a variety of ways of thinking and ways of solving problems, which can spread students' thinking

and broaden students' horizons, which is very beneficial to develop students' keen insight and judgment and mathematical literacy

### **3. The significance of stratified teaching mode in mathematics teaching in colleges and universities**

#### **(1) It helps improve students' awareness of active participation in learning**

In the mathematics classroom of colleges and universities, group cooperation is carried out. The stratified learning mode can prompt teachers to give the students a part of the time in the classroom to break the old teachers' lectures on the platform. The students use the old classroom template to listen to the lectures. The teachers use the group teaching mode to walk. The next stage is deep into the students, increasing the opportunities for teacher-student exchanges. College students have a certain ability to control their time and self-constrained because of their relative maturity, so such cooperative exploration can enhance their learning effect.<sup>[2]</sup>

Moreover, students communicate with each other to evaluate each other, forming a relationship that is both cooperative and competitive, which is conducive to improving students' enthusiasm for learning. The collision of multiple ways of thinking among students can arouse students' interest in learning and increase the emotional experience of students' participation in learning activities.

#### **(2) It helps strengthen interaction between teachers and students**

Teacher to student interaction and student to student interaction are also a new, democratic and free teaching mode. On the one hand, effective interaction and communication can make a deeper friendship between teachers and students, students and students. On the other hand, teachers can control the situation of students, and students can also establish a good learning atmosphere, so as to maximize the realization of teaching objectives. In college mathematics teaching, it is important to cultivate students' learning enthusiasm. The integration between students and students, students and teachers enables students to have a sufficient understanding of teachers, and thus have the greatest confidence in learning.

The interactive atmosphere formed by the stratified teaching mode makes the classroom lively and harmonious, and students' enthusiasm for independent learning rises, and the quality of learning improves accordingly. Through this interaction, the students' sense of participation in the classroom is enhanced, and the interaction of cooperation and competition is very outstanding in the actual education work.

#### **(3) It helps maintain balance of achievement and stimulate interest in learning**

College students are a group inspired by learning enthusiasm. Therefore, in the specific teaching, college mathematics teachers should use different ways to stimulate students' undefined enthusiasm for learning. In addition, maintaining the balance of mathematics achievement in class is one of the most important mathematics teaching tasks for mathematics teachers in colleges and universities at present. In the specific teaching process, mathematics teachers in colleges and universities should realize this.<sup>[3]</sup> At present, many college mathematics teachers are keen on a single teaching method in teaching, although this teaching method is simple, there are great defects. The stratified teaching method has a strong pertinence and supplement in the process of teaching, which can improve the mathematics performance of the students in the class. Therefore, nowadays, mathematics teachers should extend the stratified teaching method to mathematics teaching in colleges and universities.

### **4. The application strategy of stratified teaching mode in mathematics teaching in colleges and universities**

#### **(1) Understanding students and grouping scientifically**

In order to improve the efficiency of mathematics classroom teaching, teachers should start from the scientific grouping and teach according to the individual differences of students in interest hobbies, personality characteristics, communicative competence and learning level. Teachers can divide the whole class into three levels: A, B and C, but these three levels are not unchanged, which are dynamically adjusted with the development of students in the learning process.

Firstly, teachers should let students understand that students are the main role and learning is the theme in the stratified teaching mode, so as to strengthen students' awareness of cooperative learning and make them have a clear understanding of learning, which is the key to improve learning efficiency. Students should first understand their role and status in learning and plan their learning according to the established overall learning process. In this process, three levels of students can volunteer to form a group for inquiry learning. Group members form a sense of integrity and an atmosphere of mutual help, honor and disgrace. From this point on, students' learning style has been changed.

In stratified teaching, the rationality of stratification has a decisive influence on the final effect of teaching. For the principle of stratification, teachers should focus on research according to each student's basic situation and personality characteristics, learning ability and background to achieve a comprehensive. Teachers can establish a scientific and fair scoring mechanism, which is a great help to promote the teaching effect. The teaching evaluation mechanism should pay attention to the encouragement and guidance of students, help students to build self-confidence and enterprising spirit, and make students form a positive learning attitude and enthusiasm.

#### (2) Formulating stratified teaching objectives and carrying out stratified teaching.

In college mathematics teaching materials, there are not only the basic knowledge of the relevant content, but also the comprehensive use of practice, as well as a series of applied training. Teachers should have a proficient grasp of teaching materials and knowledge, on the basis of which a set of complete and comprehensive teaching system should be established. And according to the content of the teaching system, students at different levels and groups should set teaching objectives to adapt to them. For example, teachers should ask students at A level to fully complete their teaching objectives and cultivate students' ability of self-learning in mathematics; Students at the B level complete some of the teaching objectives and cultivate students' interest in learning and self-confidence; Students at the C level should strictly base their foundation and master the basic knowledge of mathematics<sup>[4]</sup>.

Classroom is the key point of mathematics learning in colleges and universities, after formulating the corresponding stratified teaching objectives, teachers should also pay attention to stratified teaching in mathematics classroom, highlighting the level of education. In the same class, teachers should adopt different teaching methods, teaching strategies and indicators for students of different group levels. For example, in the actual teaching process, teachers should mainly focus on students at A and B levels, and give one-to-one tutoring to individual students at C level, so that the top students master all the knowledge, the middle students master most of the knowledge, and the poor students master the basic knowledge. The main implementation process is as follows: for students at level A, teachers should try our best to speak less and practice more, cultivate students' consciousness of independent inquiry, improve their comprehensive ability of using mathematics through independent learning; for students at level B, teachers should focus on conciseness and urge students to make more efforts in mastering basic knowledge and basic skills of mathematics; for students at level C, teachers should lower the requirements, speak more shallowly and practise more strictly in order to grasp the basic knowledge and skills of mathematics, and cultivate the confidence of these students in learning mathematics well. Teachers should adopt flexible and diverse teaching forms in classroom teaching, so that students at all levels are willing to participate in teaching activities, stimulate students' inherent learning potential, and then improve the teaching efficiency of mathematics classroom.

#### (3) Periodic changes at all levels

Although stratified teaching is a more scientific and advanced teaching method, there will be drawbacks and problems in the application process. For example, classifying students into different categories can easily lead to students' unbalanced psychology, students at level A may have pride and be satisfied with their learning state, some students with good self-control may seek another level again, students with poor self-control will not be able to guard against arrogance and begin to go downhill. Students at level C will have inferiority complex and feel that they are "poor students" and are not valued by teachers or respected by students. Such psychology will affect their learning

enthusiasm instead. Originally, stratified teaching was intended to enable students to compete and improve in an environment more suitable for themselves. The results are counterproductive. Students at level C may “smash a pot to pieces just because it’s cracked” and stop seeking progress because of their inferiority complex and self-closed sensitive psychology.

Such problems will appear one after another in stratified teaching. Mathematics teachers in colleges and universities should always pay attention to the learning state and psychological changes of students, and should constantly perfect and innovate stratified teaching while guiding correction<sup>[5]</sup>. Teachers should regularly change the division of levels, such as the results at the middle and the end of each term. On this basis, new levels and groups should be divided according to students’ acceptance ability and learning status, so that students can know that learning performance and learning status are not permanent and will change with the change of learning attitude. If students at the A level are complacent and do not seek progress, they will fall. The students at the B level may enter the A level with a little effort, learn from more powerful competitors, and progress in a more intense learning atmosphere. If you don't work hard, you will go back to the C level and re-establish the foundation from the most basic part. As long as the students at the C level continue to work hard and constantly pull up, they can also make a blockbuster.

Regular changes at all levels help stimulate students’ enthusiasm for learning. Each level of change is also a summary of students' learning situation at one stage, so that students can understand where they are in their own group, at what stage, so that students’ learning is more targeted.

## 5. Conclusion:

The above is an analysis of the practical significance of the stratified teaching mode in mathematics teaching in colleges and universities. On the whole, the stratified teaching is a very efficient teaching mode and learning means, which allocates learning tasks to individuals. Then the learning results are shared within the group, which not only slows down the learning pressure, but also improves the learning efficiency in line with the reality of the students, and can effectively control the polarization of mathematics learning, which is beneficial to the overall improvement of teaching quality.

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