

# Changing the Classroom Teaching Model and Cultivating Students' Comprehensive Qualities\*

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**Abstract**— In order to meet the diversities of subject contents and students' learning methods as well as the personality of the students' learning process, teachers have to change their traditional classroom teaching model and cultivate students' comprehensive qualities. During the classroom teaching of “modern analytical methods of material”, the author breaks the restriction of the traditional teaching model. Four changes of the teaching concepts and three kinds of optimization for the classroom teaching are tried to introduce to the author's classroom teaching. The effective teaching result is achieved.

**Keywords**—Modern analytical methods of material; Classroom teaching; Teaching model; Comprehensive qualities

## I. INTRODUCTION

Under the guidance of the learning environment design theory and time frame, classroom teaching mode is the teaching activity structure and teaching method to achieve a certain teaching goal<sup>[1]</sup>. The diversity of the teaching contents, the complexity of the teaching process and the differences of the teacher's understanding to the teaching process, which determines the diversity of the teaching model<sup>[2]</sup>. Meanwhile, the differences of students' intelligence and the variety of learning styles also lead to the diversity of learning style and the individuality of the learning process. All these forcing teachers have to changing the traditional classroom teaching mode, selecting those open and diverse methods and strategies to cultivate the students' comprehensive qualities.

During the course of the teaching process of “modern analysis methods of materials”, four changes of teaching ideas and three optimization of classroom teaching were introduced to the classroom teaching, to combine the basic theory of

modern analytical methods with scientific research practice and production practice. Pay attention to the training of students' knowledge and abilities, thinking and intellectual development, and taking into account the combination of ideological and moral education and non-intelligence factors, to cultivate students' intelligence, energy, quality, and so on.

## II. SOME CHANGES IN THE IMPLEMENTATION OF TEACHING IDEAS

### A. “Teaching ” to “Teaching and Educating ”

Previously, the author only focused on how to teaching good books, how to better explaining the contents of the extent clearly. The results for it is no matter how hard the teachers prepare before class, how hard trying to explain in the class, the phenomenon of the students failed in the exam still existed. Random observing and chatting with students, I found that the students need a good teacher and helpful friend than a serious and responsible teacher. To improve the teaching quality and realize the quality education, the teachers should renew their teaching ideas, improve their teaching method and optimize their teaching process. At the same time, teachers should set an example by themselves, have deep love to their students and become a good friend of the students.

Therefore, in the subsequent teaching process, the traditional teaching habit is changed. According to the contents of the course, the classroom experimental environment is created. The classroom effects are better. For example, in explaining the concept of re-crystallization annealing, a lead wire and a low carbon steel wire were prepared before the class. At the beginning of the class, two students were asked to test

\*“modern analytical methods of material”teaching team construction fund; educational reform project of graduate department and academic affair office construction fund.

the hardness of two wires using a portable tester, then bending two wire several times and measure its hardness at the same time. Experimental results showed that the hardness in bends of two wires increased. After a certain period time, two students were asked to measure the hardness in the bend of two wire. The hardness tests results illustrated that the hardness of the lead wire decreased, while that for the steel wire has no change. Why is this? Less than 15 minutes were used to let the students express their views on above phenomenon. Then the teacher told the students that the hardness of two wires increased after the first bend, which is known as the work hardening phenomenon. And after a period of time, the hardness of the lead wire decreased, while that for steel wire was not decreased, it is the re-crystallization annealing phenomenon that we will learn today. Therefore, the concepts of the re-crystallization annealing and its temperature were explained logically. Under such experimental environment, the students remember the concept of the re-crystallization annealing and other related knowledge; review the concept of the work hardening better.

As the saying goes, “kiss the teacher, believe in the word”. No love, no education. The attitudes of the teachers to the students will directly affect the relationship between teachers and students, and then influence the effects of teaching and educating. A teacher is bound to get the love of his students who love students. His requests to the students will be accepted happily. In contrast, a teacher does not love his students, even if his opinions and demands are correct, students may also indifferent and even produce an antagonistic mentality and confrontational behavior. Therefore, the teacher who teaching and educating is full of good will to all the students firstly.

But meanwhile, teachers should be strict to the students. At present, there are some bad phenomena such as moral hazard and lazy learning existed. To overcome the negative effects existed in the students and complete their studies successfully, strict requirements and managements are extremely important. For example, teachers should do a good job in class attendance record, correct and explain homework in time, strict examination standards and those who failed in the exam could not pass. Simultaneously, teachers should pay attention to the relationship among strict, rationality, limitation and details. Secondly, teachers should keep in mind that example is better than precept. Teachers’ personal demonstration is a kind of silent and effective education for students. Teachers’ behavior, work attitude and professional ability etc, have a subtle effects on the students. If teachers’ professional discipline is poor, for example, be late for class, dismiss the class earlier, optional adjust the class, arbitrarily find someone to substitute, phone or pick up the phone etc, it is difficult to require the students to abide the discipline of the class.

#### B. *“Want Me to Learn” to “I Want to Learn”*

The traditional studying view, “want me to learn “have to be transformed to “I want to learn” that the students are willing to accept. How to change it? It is the first question that the teachers have to face.

In the course of many years teaching, I found that the introduction lesson as the beginning of a professional

curriculum, teachers should introduce such knowledge to the students as the subject frontier knowledge, the main development and contents, learning purpose and the engineering case of typical application. If above contents be introduced with a simple and straightforward way, then the students will feeling boring and do not aware of the necessary of this professional course[3]. In the expositive teaching of the introduction of “modern analytical methods of material”, I emphasize the application of real research cases, giving the full play to the guiding role of the introduction and the class teaching effects is better. A large number of research examples are introduced into the class of the introduction, to stimulate the students further studying and exploring the strong desire of the subject knowledge through the examples analysis. For example, two scientific research papers were selected to study in the introduction of “modern analytical methods of material”. The main content of the paper be not explained and intuitive understanding the analytical methods contained in paper. Through the studying of this course, “a pair of clear eyes “be obtained. With the helping of the instruments, the microstructure of the material is investigated easily. Under the guidance of above cases, the main structure and the main contents of the subject are explained.

#### C. *“Teaching Before” to “First Learn to Teach”*

The traditional class teaching mode is that questions reviewing, new curriculum introducing, definition and practices explaining, examples, application, summary and homework<sup>[4]</sup>. Some teachers explained from the beginning to the end and the students’ performance are sleepy, the results to that is the absorption rate of the main content is very low. If things go on like this, more and stronger emotion weariness appeared, and the phenomenon of sleeping in the class and skipping appeared. While to the teachers, the courage of teaching lost. During the teaching of “modern analytical methods of material”, I realized this transformation in the form of role exchange. At the end of the class, the key contents of the next class be pointed out, and this part content be prepared in the form of homework. The students are required to explain the main content of the homework, and other students may do appropriate supplement. Then the teachers explain the key point carefully. The results for this is that the students dare not skip the class firstly, be forced to prepare the next class and exercise their spoken ability in front of people. When the teacher explain the contents again, the students will listen carefully and comparative analysis the difference for understanding to the contents between the teacher and himself. Unconsciously, the contents are understood by the students and the class efficiency greatly improved.

#### D. *“Homework” to “Classroom Work”*

Previously, a part of homework was left to the students to save class time, the results showed that there are existed the phenomenon of plagiarism and part of students don’t finish homework by himself.

To test the students’ class learning effect more truly, the homework was transformed to class assignment, the results for that are the students can communicate with the students more

easily. It is help for the teacher find the questions existed in the students, and the question can be corrected quickly. The information between the teacher and the students communicate smoothly and realize teaching and learning synchronously.

### III. IMPLEMENT “THREE OPTIMIZATION” OF THE CLASSROOM TEACHING

#### A. Optimize the Classroom Teaching Objects

Teaching goal is the starting point and destination of the classroom teaching. It is the desired objective of the students' learning results and the guide of learning studying activity. Therefore, optimizing the teaching objective is an effective way to improve the classroom teaching efficiency. To enhance the target awareness of teaching, the teacher must study intensively the teaching material, distinguish the key point of each chapter, and understand the real knowledge of the students, set scientific and reasonable teaching goals accurately and appropriately. At the same time, the teacher should grasp the teaching content and pay attention to the accuracy of the teaching objectives. Not substitute “teaching requirements” for “teaching objectives”, the contents need to “understood” can not be determined as “comprehend”, and the contents needed to “understood” can not be defined as “skilled”. Guarantee the validity of the teaching goal, every part of the class teaching should aim at the teaching target. All the objectives and requirements of teaching activities must be completed in the class and class tests are supplemented. Otherwise, the class teaching is blind and random.

#### B. Optimize the Classroom Teaching Contents

Optimizing teaching contents is the breakthrough of carrying out quality education. Teachers should select carefully classroom contents according to the syllabus and the actual situation existed in the students, study and grasp the teaching material carefully, delete or supply the classroom contents besides textbook properly, combine with the teachers' knowledge, research experience and emotion, grasp the relationship between the key point and knowledge, striving to achieve outstanding focus and breaking through the teaching

doubt and difficulty existed at present. The arrangements of the teaching content not only conform to the system of the subject knowledge, but also accord with the studying law of the students. Teachers must pay attention to the knowledge and ability training, thinking and intellectual development of the students, but also take into account the combination of students' ideological and moral education and non-intelligence factors, cultivate the students' intelligence, energy, quality and so on.

#### C. Optimize the Classroom Teaching Methods

Optimization of classroom teaching mode is the highlight of the implementation of quality education. Under the guidance of imparting knowledge, wisdom edification and nodal life, teachers should implement new theory and new technology in teaching method and training students' good learning habits and mater scientific learning methods according to the teaching goal, teaching content and teaching environment. Teachers not only give the “key” of leaning, but also let the students know how to make the “key”. During the teaching process of “modern analytical methods of material”, the following five steps were confirmed, that is review introduction, exhibit reading outline, guidance, practice and summary.

In view of the shortcoming of the traditional class teaching mode, during the course of “modern analytical methods of material”, the limitation of the traditional teaching mode is broken, three changes of the teaching idea and four optimization of the class teaching were tried introduce this class, and the classroom teaching effects is better.

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