

# Research and Practice on Teaching Reform of Electrical and Electronic Technology

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## Abstract

This paper mainly introduces the teaching contents, teaching methods and experimental teaching problems of electrical and electronics technology course. In particular, it analyzes the actual situation of non-electrical students in ordinary colleges and universities, and gives more adaptable teaching contents, teaching methods and experimental teaching reform methods. It is hoped that in the course of practical teaching in the future, students' learning enthusiasm and initiative can be fully stimulated, students' potential can be fully tapped, and students' learning achievements can be greatly improved. In this way, it can play a certain role in promoting the development of teachers, greatly improving their information literacy, changing the original teaching methods, and improving teachers' scientific research ability. In this way, it can also play a certain role in promoting the construction of a sustainable society in China.

## Keywords

Electrical and Electronic Teaching; Current Situation; Reform; Multimedia Technology; Open Laboratory.

## 1. Research Background of Current Situation and Reform of College Electrical and Electronic Technology Teaching

Electrical and electronic technology courses can be divided into circuit theory, analog electronic technology and digital electronic technology. The basic theory, basic knowledge and basic skills of these three parts are described in detail in order to enable students to acquire professional knowledge in Electrical and electronics. Lay the theoretical foundation of Electrical and electronics for engineers and technicians in future, make them receive necessary basic skills training, promote students' logical thinking ability, computing ability and problem solving ability to be greatly improved. However, the teaching difficulty of this course is very high because this course has few hours and involves many knowledge points, but there is no corresponding textbook.

## 2. Problems in the Teaching Field of Electrical and Electronic Technology

### 2.1. The Lag of Teaching and Textbook Content Is Very Strong

At the present stage, the students' autonomy is generally weak, but many contents in the field of electrical and electronics teaching are difficult for students to understand deeply. Therefore, it is difficult for students to understand all contents in class time. In other words, there are some problems in the teaching of electrical and electronic technology in colleges and universities, and the adaptability between them and students' cognitive ability is not strong. For example, some chapters in the field of electrical and electronic technology textbooks have not properly

completed the problem introduction work, nor actively summarized. Some teaching contents attach too much importance to theoretical knowledge, but the practical content has not received due attention. Under this background, it is very difficult to fully stimulate students' interest in learning.

## **2.2. It Is Difficult for Traditional Teaching Mode to Fully Stimulate Students' Interest in Learning**

Traditional teaching mode is actually a teaching mode formed under the influence of examination-oriented education concept. Through practice, we can understand that in the process of practical application of this teaching mode, it is difficult to fully stimulate students' interest in learning. on the contrary, it is possible for students to develop a certain feeling of weariness. The reasons for this problem are analyzed in detail because it is difficult to fully stimulate students' learning enthusiasm and initiative in the process of practical application of this teaching mode. Teachers occupy the dominant position in the actual teaching process. What students need to do is to follow the teacher's train of thought.

## **3. Analysis of Teaching Reform Method of Electrical and Electronic Technology in Colleges and Universities**

### **3.1. Actively Carry Out Reform on the Basis of the Original Teaching Content**

Electrical and electronic technology itself is a required course for undergraduate non-electrical majors, and because this course involves the theoretical basis of circuit, digital electronic technology and other content, including a lot of content. In the process of learning this course, non-electrical major students only hope to have a certain understanding of this knowledge, which is difficult to guarantee the learning efficiency and learning effect of students. In the actual teaching process, we only pay attention to concepts and knowledge points, but do not pay attention to the specific application of each knowledge point. Therefore, in the actual teaching process, we should improve from the following aspects.

First, all the knowledge points involved in the textbooks should be from shallow to deep. Under the background of detailed analysis of concepts, teachers should choose appropriate theoretical knowledge to impart to students according to the actual situation of each major. Teachers should control the difficulty of theoretical knowledge within a certain range, and eliminate the knowledge that is difficult to understand and unimportant to students as far as possible, and find knowledge points that can meet the practical needs of students. In this way, students' learning enthusiasm and initiative can be fully stimulated to ensure the efficiency and effect of classroom teaching.

Second, this course is generally for students entering the learning stage of sophomore. According to sophomore's psychology and resting characteristics, at the beginning of the course, the students' major should be taken into consideration. This course should be intersected with the professional knowledge learned by students according to their majors, and permeated in all aspects, and connect each knowledge point with the power electronic profession development present situation. It can not only make students realize that this course plays an important role in the future after entering the society, but also make students trust teachers more and communicate with them actively.

Finally, under the background of guaranteeing the efficiency and effectiveness of classroom teaching, we actively advocate students to participate in the course design, design competition and other competition-oriented activities, so as to greatly improve the overall quality of students. In this way, it can play a certain role in promoting students' comprehensive development.

### 3.2. Reform on the Basis of the Original Teaching Methods

Teachers should make full use of multimedia technology to complete the classroom teaching work. The course of electrical and electronic technology will involve formula derivation, icon drawing and other contents. If only blackboard writing is done on the blackboard, it will not only consume more time, but also make the classroom teaching becomes very boring. In the practical application of multimedia teaching mode, graphics, sound and animation effects can be effectively applied. Thus, it can guarantee the vividness and intuition of teaching content, attract students' attention, and promote students' learning enthusiasm and initiative to be greatly enhanced. For example, in the process of explaining the principle of current amplification, if we carry out teaching through blackboard writing, it is not only difficult for students to form a clear understanding of this principle, but also has a certain impact on students' learning enthusiasm. If we can show students the direction of multi-sub diffusion motion and minority-sub drift motion through multimedia technology, it will be easier for students to accept it. In the process of using multimedia technology to carry out teaching work, the content on each PPT should be concise and clear. Teachers should also integrates multimedia teaching technology with traditional teaching mode, and should not tell too fast in the course of lecture, and can adjust the course of lecture according to the actual learning effect of students, and can also put forward some questions to students at an appropriate time to investigate the actual situation of students.

### 3.3. Construction of Open Laboratory

In the process of traditional electrical and electronic experiment teaching activities, Students take the class as the unit to complete the same experimental content within the given time limit, and finally hand over to the teacher for acceptance of the experimental results. In order to properly deal with the acceptance, students generally only attach importance to the results but not to the process, and learning efficiency and learning effect are difficult to be guaranteed. If the experiment is more comprehensive, students are generally difficult to complete within the given time range. Therefore, the management system of opening laboratories to students only in a given period of time in universities should be improved to a certain extent, and a more open and flexible operation mechanism should be constructed. In the practical application of this operating mechanism, it is conducive to the development of students' individual thinking and innovative spirit. In the process of practical application of open experimental teaching mode, it can lay a solid foundation for students' independent learning and practice. Students can choose among various experiments according to their own professional interests, and they can also validate their ideas in the laboratory. In this context, an atmosphere of independent experiment is created to enable students to independently explore, propose and solve problems, and promote students to gradually change from passive acceptance of experiments to active implementation of experiments. The electrical and electronic laboratory is shown in figure 1.



**Figure 1.** Electrical and electronic laboratory

#### 4. Conclusion

What is mentioned above is some ideas put forward for the reform of the course teaching system of electrical and electronic technology. After a period of teaching practice in the past, this series of reforms have proved to be very effective. Under the background of fully stimulating students' interest in learning, the potential of students will be fully tapped, and students' academic performance will be greatly improved. In the process of education informationization and globalization, the speed of informationization construction of courses of electrical and electronic foundation has been greatly improved. In the face of various types of challenges, the teaching content and methods of basic courses have been constantly improved. Teachers of basic courses in domestic colleges and universities will actively respond to these problems, establish new educational concepts, effectively improve their information literacy level, change the original teaching methods, and promote students' scientific research ability and practical ability to be greatly improved. In this way, it can play a certain role in promoting students' comprehensive development

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