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Reform and Thinking of Analog Electronic Technology Course in College Teaching

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Abstract: *As a professional course that electronic majors must learn, analog electronic technology course plays an important role in students' professional learning, and the overall course is relatively strong in engineering practice. In addition, with the continuous development of technology in recent years, the pace of learning is getting faster and faster. The teaching reform around this course has always been a hot topic that many teachers focus on. Based on the practical teaching content of the analog electronic technology course, this paper thinks about the innovative teaching development mode of this course from the perspective of teaching reform in colleges and universities, hoping to adopt modern teaching technology, improve the reform of practical teaching, improve the quality of electronic technology course teaching, and promote the overall quality improvement and development of electronic students.*

Keywords: *Analog Electronic Technology Course; College Teaching; Reform; Reflection*

1. Introduction

In recent years, electronic technology has shown a rapid and active development in the era of development. Analog electronic technology courses provide an important basis for development technology in the transformation and development of the information society, and are very important basic learning courses for electronic students. Because this course is relatively important and the threshold for entry is relatively high, it is difficult for students to learn. Therefore, teachers need to carry out in-depth discussion around the teaching reform of this course, understand the important reform direction of this course, combine the teaching characteristics of the course, innovate their own teaching mode, and truly bring better learning experience to students.

2. Characteristics and Existing Problems of the Course "Analog Electronic Technology"

Analog Electronic Technology is an important basic course. Its main contents include: electronic components in electronic technology, transistor amplification circuit, integrated operational amplifier amplification circuit, negative feedback amplification circuit, signal generation oscillation circuit, etc. This course involves a lot of knowledge points and concepts, including a wide variety of basic circuits and a large amount of calculation. Compared with other basic courses, analog electronic technology has a complete theoretical system and strong practicality. After learning this course, students should be able to independently carry out simple installation, debugging, analysis and design. However, the content of "analog electricity" involves many knowledge points and requires high theory.[1] With the development of the times, the traditional analog electronic technology curriculum has been unable to meet the needs of society. Abstract professional knowledge and monotonous teaching methods make it more difficult for students to master abstract knowledge. In the teaching practice, students' awareness of active participation is not strong, and students' potential is not fully developed. Experimental teaching requires the combination of theory and practice. However, in the teaching of analog electronic technology, there is an obvious disconnect between theory and practice. The experimental content and items are outdated, time information is insufficient, and the experimental items are lack of systematicness. In this course, students have already had a partial understanding of the theoretical knowledge they have learned, but how to apply it to engineering practice has formed a gap between theory and practice, resulting in some students' fear of difficulties, low learning enthusiasm and poor learning results. How to cultivate students' learning motivation, learning interest and practical ability has become the current teaching difficulties.

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3. Renewal of Teaching Material System of Analog Electronic Technology

At present, most analog electronic technology textbooks adopt the pressurized form of undergraduate and junior college textbooks, and their theoretical teaching content is biased. Most textbooks are written jointly by teachers from various professional schools or by teachers themselves, and experts from factories and enterprises are not invited to participate. The content of textbooks is backward, and the content of new knowledge and new technology is low, which cannot meet the needs of social and economic development, nor can it fully reflect the characteristics of college education. In order to better reflect the characteristics of analog electronic technology textbooks, we should adopt independently compiled textbooks[2].

First, the original textbook system needs to be reformed. The textbook is divided into two parts: theoretical knowledge and practical knowledge. The compilation of theoretical knowledge module is based on the analysis of professional skills. According to the professional knowledge structure of electronic, electromechanical, computer and other professional fields, and taking into account the long-term development needs, a professional knowledge system with professional characteristics is built on the basis of "must" and "enough". The basic concepts and principles of analog electronic technology should be explained clearly, eliminating tedious formulas and lengthy theoretical analysis. Those that can be qualitatively analyzed do not need to be quantified, and those that can be explained with graphics do not need to be described with language, which can save a lot of class hours. The preparation of the practice knowledge module is: first, there are sufficient confirmatory experiments, second, there are virtual experiments of electronic technology, third, there are more comprehensive and designed experiments, and fourth, there is the training of knowledge practice and post-practice skills. The connection of these practical operations should be reflected in the whole textbook.

In addition, we should also strengthen the effective construction of the teaching material compilation team. Because there is a clear link between the quality of curriculum teaching and the quality of teaching materials, and the quality of teaching materials is closely related to the overall quality of the teaching material compilation team to a certain extent. In order to ensure the effective improvement of teaching efficiency of electronic technology courses, electronic technology textbooks need to be fully prepared. The school can consider hiring senior engineers and professional engineers from electronic manufacturers to participate in the compilation of textbooks in the school, which can inject the latest professional information into the teaching materials, and these engineering and technical personnel can also bring some front-line new technologies and processes. We can really combine theoretical knowledge with practical knowledge. The school can organize teachers of professional courses and analog electronic technology courses to discuss together, and feedback the professional course teachers' understanding of electronic technology and the knowledge points used in professional courses to analog electronic technology course teachers, so that teachers can highlight these professional knowledge points when writing specific content. The effective connection between the front and the back of the knowledge is really achieved, and the further teaching innovation and development of the specialized technical courses are realized. By employing teachers of electromechanical technology, computer technology and other related majors to jointly compile textbooks, it can be pointed out that the important application of analog electronic technology is reflected in the computer field and electromechanical field, which can better reflect the professional characteristics of the textbooks and the future development trend, so that students can understand their own career planning.

4. Curriculum Reform of Analog Electronic Technology Theory

In the traditional theoretical teaching of analog electronic technology, the teacher explains word by word according to the content of each chapter and section of the textbook, spends a lot of time on theoretical derivation and analysis, neglects to cultivate students' ability to learn independently, neglects the specific application of knowledge points, and neglects the training of students' professional skills and vocational skills. This kind of teaching mode will cause students to be unable to think, analyze and solve problems by themselves. Most students only know to follow the teacher's teaching rhythm, but do not know how to think through drawings, understand circuit functions, analyze the causes of circuit failures, let alone carry out subsequent circuit maintenance. This teaching mode deviates from the educational concept and cannot serve the cultivation of students' vocational skills. Therefore, in terms of theoretical teaching, teachers consider to adopt the way of self-compiled textbooks and collective lesson preparation. Teachers will discuss which theoretical teaching is the key,

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which is the omitted part, and which content needs to be left to students to explore. This theoretical teaching mode can not only highlight the key points, but also enhance the students' self-learning ability. With the continuous development of science and technology, new knowledge and technology continue to emerge, and new technologies and knowledge continue to emerge. In order to train students to become advanced technology application talents, they must have good self-learning ability and constantly absorb new knowledge and technology to meet the needs of modern enterprises and factories for talents. At the same time, in theory teaching, teachers should highlight the use of theoretical knowledge according to students' professional skills and professional skills, so as to achieve the purpose of serving the actual.

5. Renew the Practical Teaching Mode of Analog Electronic Technology

In the traditional practice teaching, teachers often conduct theoretical guidance first, and then carry out verification experiments. The practice form is single, and the practice content is simple. The practical methods and steps have been determined and completed according to the original experimental steps. In practice, as long as students simply move some keys, they can see the results and simply make a record. This practical teaching mode cannot cultivate and train students' practical ability. Therefore, in practical teaching, we must renew it from two aspects.

First of all, teachers need to ensure that the practice of analog electronic technology is diversified and interesting. The electronic working platform has created a comprehensive and complete experimental environment for users, including circuits, experimental analysis and output. It provides users with more than 10000 kinds of equipment, as well as new virtual equipment. LED can emit red, green and blue light, and the peaker can emit a variety of timbres, all of which can improve students' enthusiasm for learning and teaching quality. At the same time, we should strengthen the comprehensive application knowledge and improve the comprehensive application ability of experimental skills. For example, let students assemble and debug the video recorder by themselves, including voltage amplification, power amplification, integrated operational amplifier, oscillation circuit, DC stabilized power supply, etc. During the experiment, students will refer to the functional parameters and use rules of many components, the connection of experimental lines, the selection of components, the selection of methods, and the steps of the experiment, which can be made by students themselves. Teachers will also give some guidance and suggestions. Through the simulation of electronic technology, students will be guided to adjust their circuits to the correct position and then weld the components together, so that students can master various professional skills.

Secondly, enrich the practical teaching content of analog electronic technology. In order to apply theoretical knowledge to practice, turn knowledge into practical productivity, stimulate students' enthusiasm for learning, and transform passive learning into active learning, teachers can set up an electronic production team and hold an electronic production competition. For example, electronic doorbells, holiday lights, multi-function speakers, radios, etc., many of these experiments are conducted by students themselves to find information, design, debug, and assemble, and teachers only provide guidance to a certain extent. These practical activities can fully stimulate students' enthusiasm for learning, explore their creative potential and promote their creative thinking. At the same time, teachers can use their spare time to organize students to repair household appliances in the community, and hire professional teachers for maintenance and skills training. During the maintenance period, the students not only strengthened and consolidated the knowledge of analog electronic technology and practiced their own hands-on skills, but also learned some knowledge that is not available in textbooks, such as maintenance skills. In this way, students can expand their knowledge, broaden their horizons, and cultivate their spirit of cooperation and the concept of serving the society.

In addition, in conventional experimental teaching, teachers can consider taking the form of a second classroom to cultivate students' personality. The teaching content of the second course can be formulated by teachers or students themselves to improve students' practical operation ability. Multimedia software can be used for simulation to strengthen students' independent thinking and design, and real objects can be made to stimulate creativity. In teaching design, teachers can provide guidance and help for students to solve problems. After completing the courseware, we will organize works exhibition, academic exchange, etc., and compare and analyze the problems existing in the design work, and make improvements. This will enable students to truly combine theory with practice in their study, and lay a good foundation for further study and employment.

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6. Innovating the Teaching Method of Analog Electronic Technology

In terms of innovative teaching methods, teachers can consider using multimedia technology. The traditional teaching method is often a blackboard and a piece of chalk. The teacher only uses a medium to teach the course content. Some concepts of analog electronic technology are abstract, the theory is complex, and the program is cumbersome. Students can only imagine according to the teacher's explanation. Learning is boring and boring, and the learning efficiency is not high. The multimedia technology is to organically combine words, sounds and images. According to the requirements of the teaching content, it highlights the key points, solves difficulties, and makes modern education full of new vitality and vitality. Multimedia technology can make the teaching process vivid, visual, realistic, abstract concepts into concrete. Let students have a special sense of intimacy in the classroom and cultivate their creativity. On the other hand, new knowledge and new products can be introduced into the classroom quickly and effectively by using multimedia technology. With the rapid development of science and technology, a variety of new materials, new devices, new circuits and new technologies emerge in an endless stream in electronic technology, with a wide variety of new products. Even the latest textbooks are difficult to fully absorb, and multimedia technology can make up for this defect. For example, using the Author ware software, a new and practical electronic courseware has been developed, and the parameters and main working principles of these diodes, such as VCD and DVD, which are widely used in teaching and are not used in textbooks at present, have been explained in the way of courseware expression, so that students can have a deeper understanding of diodes. In this way, we can make up for the lag of textbooks, so that the analog electronic technology course education can better adapt to the development of science and technology.

7. Conclusion

In a word, the innovation of analog electronic technology is a hot topic at present. Teachers need to clarify the teaching characteristics of analog electronic technology courses and summarize innovative teaching models. It is believed that the implementation of the above teaching methods can not only stimulate students' interest in learning, but also give full play to students' subjective initiative and initiative, greatly enhancing students' creative thinking and practical ability. Enrich students' professional technology and skills with the innovative course mode, laying a good foundation for successfully completing the courses learned and the work related to the electronic industry in the future.

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