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# Practice of Teaching Reform of Digital Electronic Technology

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## Abstract

**As a basic course for undergraduates majoring in electricity and information, Digital Electronic Technology plays an important role in the professional curriculum system. In view of the problems existing in the teaching process of digital electronic technology course, this paper summarizes a series of reform measures in teaching practice from the aspects of teaching methods, teaching content, assessment methods and network-assisted teaching, and achieves good results in actual teaching.**

## Keywords

**Digital electronic technology; teaching reform; learning ability.**

## 1. Introduction

Digital electronic technology plays an increasingly important role in the development of Electronic Science and technology. To learn the basic course of Digital Electronic Technology well is not only a good foundation for the follow-up professional courses, but also very important for their future work. However, the course of Digital Electronic Technology is abstract and practical, with fewer class hours. The existing teaching mode emphasizes theoretical learning but neglects practical application. Teachers inculcate knowledge unilaterally while students passively accept it. Students have low interest in learning and poor practical application ability. With the deepening of quality education, the teaching process of colleges and universities should focus on cultivating autonomous learning ability, problem solving ability and practical innovation ability. In this context, "digital electronic technology" reform is imperative.

## 2. Reform of Teaching Methods

### 2.1. Guided Teaching Method

In traditional teaching, teachers, as absolute subjects, indoctrinate knowledge to students unilaterally, lay particular stress on the teaching of theoretical knowledge, emphasize the memory of knowledge and neglect the application of knowledge; learning and using are severely disconnected, and there is no interaction between teachers and students, so teaching has evolved into a teacher's one-sided play. Accordingly, the author takes the application example as the lead in teaching and adopts the guiding teaching method to teach Digital Electronic Technology. This teaching method pays attention to the cultivation of abilities of analysis and application, teamwork and innovation and practice. Through this change in teaching methods, students can actively participate in teaching activities, realize the change of teaching mode with students as the main body and teachers as the guide, so that students can apply knowledge to solve practical problems while understanding theoretical knowledge. For example, when teaching the knowledge of combinational logic circuit design, we can give students a practical example of "three-person voter". This problem-oriented example teaching is close to life, arouses interest and actively participates in the problem-solving process as the main body. Some novel ideas are often put forward by students in the discussion process, and

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teachers play a guiding and guiding role. This teaching process is more in line with the students' learning process. The law of Neo-Confucianism not only enhances enthusiasm for learning and thirst for knowledge, but also cultivates students' innovative ability and ability to think and analyze and solve problems. The combination of examples highlights the applicability of knowledge, so that understanding of knowledge is no longer only at the theoretical level, but also can be applied.

### 2.2. Production of Teaching Courseware

In the production of teaching courseware, the courseware matched with the original textbook is mostly theoretical text and monotonous schematic diagram, with single color, theoretical bias and dull content. In this reform, the author takes the content of textbooks as the main body, reduces the theoretical deduction of courseware design, emphasizes the application of knowledge, adds corresponding knowledge points to the analysis of representative application cases close to life practice, and designs an interesting thinking question at the end of each chapter of PPT to enable students to synthesize classroom knowledge. Sex extends thinking and expands thinking ability. Abstract theory becomes vivid through the dynamic presentation of multimedia, which greatly arouses enthusiasm for learning. The demonstration of multimedia courseware increases the interesting of teaching, saves the time of blackboard writing in class, greatly improves the teaching progress, and alleviates the problem of "short learning hours, more content" in University courses.

### 2.3. Making Microlessons

The production of micro-lessons is added to the teaching, and the analysis and explanation process of the important and difficult points in the teaching is recorded into short videos. Each video lasts for 5-8 minutes. The video can be either the process of teacher's explanation or the dynamic graphical process composed of words, pictures, sounds and animations. The main video and related teaching resources (including corresponding knowledge points teaching plan, after-class teaching reflection and teaching evaluation, etc.) are integrated into a resource package for teachers and students to download and consult. University teaching progress is faster, some difficult knowledge can‘t be fully digested and absorbed in the classroom, using micro-class students can selectively consult the corresponding resources according to their own learning situation in class, which not only facilitates students to fill gaps, but also makes up for the shortcomings of less time and more content of University courses. Because of the short time of micro-video, students can use mobile phones and other mobile devices independently in their spare time to achieve autonomous learning, which greatly improves time utilization and interest in learning, and cultivates students' autonomous learning ability.

## 3. Reform of Teaching Content

### 3.1. The Choice of Teaching Material Content

The textbooks used in this course lay particular stress on theoretical knowledge, with few or too simple examples. It is difficult for students to understand and apply knowledge simply by teaching book knowledge. Therefore, in the actual teaching process, we should expand the content of the textbook, explain some over-theoretical knowledge in popular language, add some typical examples to the easily confused knowledge, the examples are close to life or have certain skills, and the difficulty is in line with the overall level of students, so as to stimulate learning interest, which makes them more understandable and acceptable.

### 3.2. Adjustment of the Order of Knowledge Points in Textbooks

Combing the knowledge context in the textbook, paying attention to the practicability and Enlightenment of the content, reasonably allocating the hours of each chapter, and adjusting

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the order of some knowledge points in the textbook. For example, according to the characteristics of learning from shallow to deep, the door circuit of Chapter 3 in the textbook "Basic Course of Digital Electronic Technology" is adjusted to be taught after the sequential circuit. This is because the content of gate circuit is less relevant to circuit analysis and design, while the combination circuit and sequential circuit analysis use a lot of knowledge of logic algebra in Chapter II. After adjustment, the cohesion of knowledge is better. Students have a deep memory of logic algebra just learned, and they understand the knowledge of circuit analysis and design very quickly, and the teaching efficiency is improved.

### 3.3. Taking Different Teaching Contents for Different Majors

Finally, at present, digital electronic technology in our school is mainly offered in the two major fields of electronic information engineering and communication engineering. Although the textbooks used are the same, according to the characteristics of different majors, the teaching content should be biased. For example, for the major of electronic information engineering, the students of this major need to have the ability to design circuits, so the teaching hours should be increased accordingly, and the internal structure of circuits and the analysis, design and application of circuits need to be analyzed in detail, focusing on training students to use professional knowledge to solve practical engineering problems and design. Inter-engineering circuit capability.

## 4. Reform of Assessment Methods

### 4.1. Changes in the Examination Scheme

In order to solve the problems of high repetition rate of test questions in previous years and unreasonable performance evaluation in peacetime, we first set up a final examination question bank with various types of questions and high flexibility, which requires covering all the knowledge points required by the syllabus, increasing the number of comprehensive analysis questions and focusing on examining comprehensive knowledge application skills.

### 4.2. Changes in the Method of Achievement Assessment

The incentive mechanism of reward and punishment should be adopted for the performance evaluation in peacetime, which can not only stimulate enthusiasm for learning, actively participate in teaching activities and interact with teachers, make the classroom atmosphere active, but also cultivate their ability to think and analyze problems, apply knowledge and innovate practice. In addition, the final examination papers of each term are analyzed in detail, and corresponding adjustments are made to the next year's teaching in the light of the examination conditions, in order to achieve better teaching effect.

## 5. Auxiliary Network Teaching

In addition to classroom teaching, we make full use of network technology to establish a learning website and Wechat communication group for the course of Digital Electronic Technology, which provides a platform for students to study and test independently and interact with teachers. The learning website includes several functions, such as the latest development of digital electronic technology, typical applications, commonly used chip introduction, related technology and related news resources, learning method guidance, exercise database, online question-asking, online question-answering and online test.

At the same time, establish a learning exchange group, teachers can upload the electronic teaching plan, teaching plan and schedule, so that students can make clear the key points and difficulties of each lesson and the content of the next lesson, in order to do a better preview and review work more effectively. Students can discuss in groups if they have questions. Teachers

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can answer them in time, understand learning situation, and make corresponding modifications to the teaching focus according to the questions reflected by students. Using these assistant teaching methods can not only broaden knowledge, improve students' interest in learning, but also cultivate students'autonomous learning ability.

## 6. Concluding Remarks

Through a series of teaching reforms, the teaching of Digital Electronic Technology has achieved good results. The content of the course is vivid and rich, and enthusiasm for learning is greatly improved. At the same time, students' autonomous learning ability, independent thinking ability, analysis and problem solving ability, innovation and practice ability are further improved.

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