Teaching research and Practice of the course "The Assembly and Repair of Computers"

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Abstract

"The Assembly and Repair of Computers", a higher profession technical course for computer specialized majors, is also a course combining theory knowledge with practical applications. It emphasizes particularly on manipulation techniques and practical applications. According to the features of the course and practical teaching, this article gives a systematic study on the choice of teaching contents, teaching methodology and practice. In addition, it puts forward concrete schemes. Teaching contents are incorporated in three embranchments and nine modules. Nine modules correspond to nine teaching topics. Basing on action lead teaching pattern, corresponding teaching methodology is used to different contents.

Keywords

The assembly and repair of computers; Teaching scheme; Practical teaching.

1. Introduction

The curriculum of assembly and repair of computers is a skill course for computer majors. Combination theory with practice and focusing on the training of operation and application ability are two important principles in the teaching of the course. Through the course, students can master the composition and working principle of computer, understand performance characteristics and basic functions of computer, and possess skills of installing system software and application software; eliminating common failures and carrying out routine maintenance. In a word, students can master the knowledge and operation skills of computer assembly and repair, make a good beginning for improving the ability of practice and innovation by studying the course.

For the traditional teaching mode, teaching method and teaching content are no longer content to the requirements of highlighting the vocational skills training of higher vocational education under the new situation based on the characteristics of "The Assembly and Repair of Computers" such as too much content of the course, scattered of knowledge point, wide range of knowledge, and strong demand of practicality.

It is necessary to reform and study the teaching plan of this course. In the actual teaching, through long term exploration, summary and feedback from students, the teaching contents are re-integrated into three branches and nine modules. The three branches are "Performance Indicators and Options for Computer Components", "Computer Assembly" and "Computer Troubleshooting"[1][2].The nine modules correspond to nine teaching topics respectively. Based on the behavior-oriented teaching model, students are able to apply theoretical knowledge and grasp practical skills as the goal through teacher's guidance, teacher-student interaction and students' interaction, taking autonomous learning and cooperative learning as the main methods and Form. According to different teaching contents, the corresponding teaching modes are designed. The following elaborate on the study and design of teaching programs of the course "Computer Assembly and Maintenance" based on my teaching practice [3].

2. Integration of teaching contents

The traditional textbook can not completely meet the actual teaching needs of this course which requires the teaching contents supplemented and resettled. I put the teaching content reintegration.

The principle of integration is based on the following three considerations. The first is the relevance of knowledge. The knowledge of this course is not only particularly large, but also scattered in different chapters of the textbook. I extract the relevant knowledge points from the original chapter organized into modules, according to the teaching of a total of nine modules extracted. Respectively, corresponding to nine topics, the combination of hardware and software knowledge, the operating skills and the corresponding theoretical knowledge combined to enable students to the better understanding of related knowledge points. The second, in order to highlight the practicality of knowledge and pursue higher efficiency within a limited teaching time, some obsolete knowledge points (such as backward technologies of some components) and low-valued knowledge points (such as Chip-level maintenance) are deleted. In addition, "Introduction to new computer technologies" and some knowledge of the general lack of students (such as the computer startup process) are added as a supplement to the teaching content. Thirdly, in order to arouse students' curiosity and achieve better teaching results, the whole courses are taught in the form of thematic topics. Each subject has clear objectives, clear tasks and convenient operation which combine the practical skills with the corresponding theoretical knowledge in order to master the overall knowledge of the topic for the students [5]. Based on the above three considerations, I designed nine topics. Each topic is relatively independent and interrelated. The three branches of the course are supported by three topics. The branch of "computer components performance index and buy" corresponds Topics 1 and 2. "Computer Assembly" corresponds to the topics 3, 4and 5. "Computer Troubleshooting" corresponds to topics 6, 7, 8 and 9. The specific contents of each topic are as follows.

Topic One: Microcomputer System Overview. The contents include an overview of computer development, hardware systems for microcomputers, software systems for microcomputers, performance indicators for microcomputers, working principles of microcomputers, operating system-related knowledge.

Topic two: computer components performance indicators and purchase. The contents include the basic components of the computer, the performance of computer components, computer components, purchase guide, optional laptop, optional printer and cooling technology.

Topic three: computer hardware assembly. The contents include precautions, jumper settings, assembly process, boot the computer to check the hardware configuration, basic CMOS settings, common assembly problem solutions, electricity common sense, virtual memory.

Session Four: Make the computer work in the best condition. The contents include advanced CMOS settings, adjust the software environment, registry maintenance tips, upgrade the system BIOS, upgrade graphics card BIOS.

Topic Five: the difference between BIOS and CMOS. What is the BIOS, BIOS features, what is the difference between the CMOS, BIOS settings and CMOS settings and contact, when to set CMOS, clear the BIOS method, DMA and IRQ.

Six topics: computer startup process. The contents include the memory address, the main boot record, partition table, detailed startup process, computer startup failure.

Session Seven: Overview of Daily Use and Maintenance of Computers. The contents include the use of computer precautions, static electricity, power supply, electromagnetic interference and other related knowledge, to create security systems, computer virus-related knowledge, the formation of a virus laboratory, network-related knowledge and common network commands, data recovery technology.

Eight topics: common hardware problems and solutions. The contents include computer fault index, troubleshooting procedures, common computer fault detection methods, host fault detection and processing, common peripheral fault solutions.

Session Nine: Common Software Problems and Solutions. The contents include operating system common faults and solutions, multi-operating system coexistence common faults and solutions,

registry common faults and solutions, common network software failures and solutions, viruses caused by the failure and solutions.

The above teaching contents emphasis the fusion of theoretical knowledge and the training of operating skills and practical abilities which reflect the vocational core competency-oriented teaching system.

3. Teaching practice of "performance index of computer components"

With the rapid development of computer technology, new technologies and new products alter from day to day. Meantime, the textbook and teaching hardware is relatively lagging. Students feel boring for this part of the course. In the actual installation process, students seldom go to the market to buy the hardware which is on the verge of being eliminated. At the same time, in the face of colorful new products and technologies, students feel strange and unfamiliar, and they do not know how to purchase them. In order to achieve a better teaching effect, a new teaching mode combining theory teaching, market research, and installation scheme is adopted [6].

In order to make up the malpractice that teaching material content cannot be synchronized with the technology development and ensure that students have a better understanding of new products and new technologies, students are allowed to enter the market and investigate computer products sold in the market . Through this Way, students' mastery of theoretical knowledge learned in the classroom is promoted, while learning many new technologies and optional experiences.

4. Teaching practice of "computer troubleshooting"

The main difficulty in computer failure learning lies in a wide range of computer failure and fault performance also varied. To help students master as many troubleshooting methods as possible for a limited time, a teaching model combined theoretical teaching with a computer failure seminar is proposed in the paper.

Specific teaching content of "computer troubleshooting" have been shown in the previous topics eight and nine. The emphasis is to enable students to master the classification methods of computer failure and determine the cause of the computer failure by methods of Intuitive examination, plug-in, exchange, and so on. The difficulty of this part is to make students understand that the same type of fault has different fault performance, even if the same fault performance may also be caused by different reasons [7].

Computer failures seminar means that each student introduced six computer failures and treatment methods previously encountered, and organize students to discuss and analyze the causes of these failures. This method allows students to encounter a large number of failures within a limited time so that they can rapidly accumulate experiences in dealing with faults and master methods of analysis and dealing with the problems. The student's ability to deal with the failures can be greatly improved.

5. Conclusion

The teaching mode of "The Assembly and Repair of Computers" is researched from integration of teaching content, teaching practice of "computer components performance indicators and purchasing strategy", teaching practice of "computer assembly", teaching practice of "computer troubleshooting" four aspects in the paper. An action lead teaching model which is adopted in the teaching process has achieved the good teaching effect. The action lead teaching model is a classroom teaching mode that takes students as the main body, learns to learn as the goal, bases on teacher guidance, interaction between teachers and students and interaction between students and students, and Takes autonomous learning and cooperative learning as the main method. This kind of teaching mode which can create a good classroom atmosphere in the process of teaching practice and achieve in cultivating students' active learning quality and learning ability have been accepted by students.

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