Optimization of Content and Method for Electronic Assembling and Adjusting Training in Independent College

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Abstract: Combined with the transformation of independent colleges put forward by the Ministry of education. Aiming at training innovative and application-oriented talents, we put forward the thinking of further building the experimental teaching system of electronic assembling and adjusting training facing the electrical majors in independent colleges. Through the self-designed teaching material "electronic assembling and adjusting training course", consolidate the basic knowledge of training teaching, reform the content and method of electronic assembling and adjusting training teaching. So that it can enhance students' understanding and mastering of basic knowledge and stimulate students' enthusiasm for learning through their own choice and active learning. The reform of training content and method had achieved good results after the implementation of 2016 level students in our department.

1. Introduction

Since the City College of Xi'an Jiaotong University declared the success of Applied Technology University in July 2014, there has been an orderly and intense reform of the students'training plan and curriculum. Since the transformation, the 2016 grade students are the first students to revise the training plan. The colleges and departments attach great importance to the modification of the training plan, and take the direction of market development and school-enterprise alliance as the orientation. Running a school as a starting point, from theoretical courses to practical courses are actively in line with the application-oriented undergraduate education orientation. The compulsory courses of electrical engineering and its automation, automation, measurement and control technology and instrument, and electronic information engineering are all being adjusted one by one. Especially for the first time, the large-scale practical training course for students of all majors, E-assembly training, as a specialized course of technology application, should combine market, technology and assembly technology. At the same time, it is more necessary to "student-oriented" so that students can complete the teaching reform of E-assembly training in the complete interactive learning process [1-2]. Based on the strong practicability of the course, practical teaching must be regarded as the key to learning. By summing up the experience of practical teaching in recent years, the author studies the optimization of teaching content and training methods of electronic dressing practice. The practice shows that the teaching effect is better and the students'interest is stronger.

2. Problems in Practice Teaching

2.1. Single form of Practice

Over the years, the course is to purchase the finished products in the market and distribute them to students for learning, welding exercises and debugging of components. Students only need to install and weld according to the contents of the teacher and the instructions step by step, and then make necessary debugging according to the results of welding assembly. Such a single mechanical teaching method is not only easy to make students feel dull and boring, but also leaves less things

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for students to think about. In addition, with the end of this course, most students will hardly make second use of and learn the suite after successful tuning, which will stifle students'enthusiasm and creativity in learning.

2.2. The Content and form of Practice Are Obsolete

Because of the choice of finished products on the market for teaching, and because of the price, learning level and other reasons, so in the selection of product types and teaching content is relatively limited. Over the years, although products such as multimeters, radios and TV sets have been installed and adjusted, the finished package solidifies the ideas and ideas of teachers and students. The outdated teaching contents and forms make the teaching effect deviate from expectations, and the novelty of students is gradually reduced.

3. Optimizing Method of Practical Teaching

Relevant responsible teachers constantly ponder and put forward the problems existing in the teaching process of electronic dressing training. Relevant leaders, teachers and experimenters have made a series of explorations and Optimization on the course. Around the students'interest and ability training as the leading idea, combined with the students' current course, they are going to study in the direction of multi-disciplinary interdisciplinary mixed learning and mobile learning. Teaching reform and optimization is imperative [3-5].

3.1. Teaching Content Optimization

There are a lot of textbooks about the training of electronic dressing and adjustment published so far. These textbooks have also played an active role in promoting the dressing and adjustment courses. However, with the rapid development of electronic technology and the continuous renewal of technology, with the transformation of our college and the promotion of the new training program, our department has compiled an applied undergraduate dressing and adjustment practical textbook suitable for the relevant majors of our department. This textbook was published by Xi'an Jiaotong University Press in January 2018 and put into use among 2016 students in our department.

In order to fit in with the application-oriented undergraduate nature of our college as an independent college, this book is mainly different from the original textbooks in the following aspects.

(1) To absorb the advantages of electronic teaching materials in recent years and consolidate the basis of experimental teaching. Focusing on basic concepts and practical teaching, combining with new technology and technology, we should pay attention to the mastery and use of basic experimental knowledge, basic skills and basic instruments. After students have a deep understanding and consolidation of the principle of dress and tune, they can effectively improve their practical ability and interest in learning.

(2) Diversification of loading and adjusting examples. Combining with the learning ability, interest and difficulty of the students in our department, the author chooses the practical examples in teaching and scientific research, and through the analysis and explanation of these examples, the purpose is to guide and expand students'comprehensive and systematic understanding of relevant knowledge, to give students the diversity and autonomy of dress choices, and to cultivate students' practical ability of analyzing and solving problems. At the same time, the training works can be used in the follow-up study and use.

(3) Introducing several EDA tools and common instruments. Through the introduction of EDA tools and common instruments, students will have a relatively complete understanding of the tools and knowledge used from design to debugging, so as to familiarize themselves with the general process of electronic assembly and adjustment.

(4) Although the book is a textbook for the basic training course of electronic dressing, it is not only limited to the electronic dressing training course, but also can be used as a reference book in other practical links and after-school learning process.

3.2. Teaching Method Optimization

Before the beginning of the class, students are provided with a number of examples of dressing, so that they can freely choose the direction of interest and make their own choices, and then explain in groups. At the same time, EDA teaching and mobile teaching mode are joined in order to enable students to study independently at any time and anywhere after class.

(1) Autonomous selection of loading and adjusting examples. From one of the past examples, we have provided a variety of examples. Especially in the textbook, we have given four different examples of electronic assembly and adjustment in detail and debugging process. In addition, according to the change of the training plan of the 2016 edition, the students in the second semester of college have already begun to learn the course of single chip computer. Therefore, according to the actual learning situation of the students in this department, an additional example of setting and adjusting the self-made single chip circuit board is provided independently. Students can take this course.

In the process of practical use, while continuing to complete their own electronic objects in the subsequent MCU experiment and training courses, it can be a good way to achieve building block practical training. The course arrangement of electronic assembly training is shown in Figure 1. The self-made single-chip assembly and adjustment welding plate is shown in Fig.2.

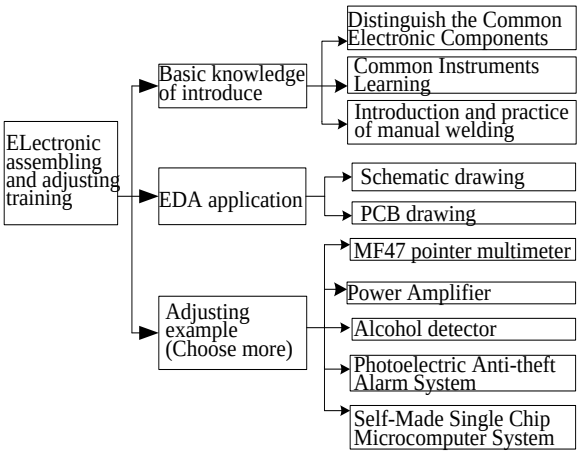
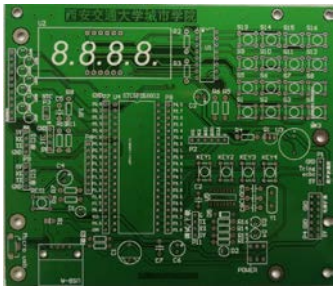
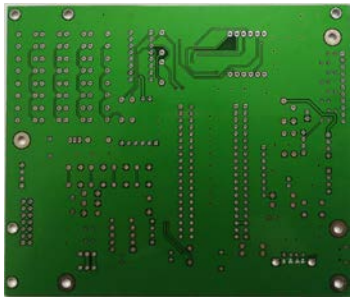


Figure 1 Electronic fitting training course arrangement



(a) Component surface



(b) Welding surface

Figure 2 Welding plate of single chip microcomputer

Students can choose examples of dressing according to their own interests. Teachers can make appropriate adjustments according to the actual situation of students'choices, and make explanations according to groups (each teacher teaches in a single group at a time according to the syllabus requirements, with 20 students in each group) in order to satisfy students' wishes to the greatest extent, so as to improve students'interest, motivation and autonomy in learning.

(2) Complete mastery of assembly and adjustment process. The training of electronic assembly and adjustment has its own complete and complete process [6-7] from principle explanation-schematic drawing-PCB production-assembly welding-post-welding debugging. Students want to familiarize themselves with the whole process in such a simple learning environment as school. Besides PCB production, other links are relatively easy to complete and realize. Therefore, in order for students to learn and master the whole process better, our department provides a complete set of PCB production equipment in the electronic engineering training base. Students can clearly understand the process and steps of PCB production in the laboratory, which makes students have a better understanding of the general process of electronic assembly and adjustment.

(3) Determining and pushing knowledge points of micro-curriculum. Combining with the characteristics of the current mobile teaching mode, micro-course, which consolidates and understands again beyond the limited classroom time, micro-course is a good assistant tool for Lesson Reform [8-10]. Video recording of the key and difficult points in the electronic dressing and adjusting training and pushing them to students through the platform of rainy classroom can make students learn independently at any time and anywhere before and after class, which can make students learn with success and twice the result with half the effort. Teachers'teaching efficiency will also be improved. Therefore, for this electronic training, we also actively applied for the school education reform project, and through the following five aspects of micro-course recording:

(a) Identification of assembly and adjustment components.

(b) Introduction to the installation and adjustment of instruments and instruments.

(c) Introduction of key welding knowledge points.

(d) Introducing examples of assembly and adjustment.

(e) Introduction of EDA software.

The key points of the above training are as follows:

The textbook written by the author has been fully embodied, and the corresponding PPT has been made. After writing the recording script of PPT, combining PPT and the necessary video in the later period, the microcourse can be recorded formally. For the microcourse assistant teaching, the microcourse time is generally controlled in about 8-10 minutes, not more than 15 minutes.

Made a good micro-course, mainly choose “Rain Classroom” software for video, courseware, homework and other teaching resources push, as shown in Figure 3. The reason for choosing “Rain Classroom” is that in other theoretical and practical courses, students have been exposed to the software, which is relatively familiar and convenient to use. Teachers can also use PPT course after class, insert necessary voice or video, edit it in Powepoint, and then publish it in the formulation class of “Rain Classroom”, and it can be through the computer or mobile phone. Wechat carries on the teaching, and students can also carry on the mobile learning at any time. Fig. 4 and Fig. 5 are the interface of “Rain Classroom” curriculum resources and the push of curriculum resources.

4. Strict Assessment System

According to the requirements of the syllabus, the students'actual operation and practice results in the classroom, and combined with the training reports submitted by the students, the training is strictly assessed independently in a five-point system (excellent, good, medium, pass and fail). Can not be on time and on time, under the guidance of teachers can not successfully complete the learning content, the results are failing; under the guidance of teachers, can draw training schematic diagram, complete the assembly and welding of training content and other basic requirements of teaching content, the results are pass; under the guidance of teachers, self-completed training schematic diagram and PCB drawing, fabrication and adjustment, and self-checking errors, the results are medium; Under the guidance of the teacher, we can draw the schematic diagram and

PCB independently, with reasonable layout and wiring, complete installation and self-checking and error-correcting, and achieve good results; under the guidance of the teacher, we can draw the schematic diagram and PCB independently, with appropriate size, reasonable layout and wiring, complete installation and good solder joint, and self-checking and error-correcting, with excellent results.

At the same time, after class, as the key training object, the students who have excellent practical ability and strong self-learning ability should first actively absorb the members of the department's electronic interest group, and then actively participate in the college's “golden idea” contest, “innovation and entrepreneurship” contest, “microcontroller” contest and other intra-school competitions, finally to the follow-up National College Students'electronic competition. Competition and various science and technology innovation contests [11-12], so that students continue to improve step by step, with some gains.

5. Conclusion

“Electronic Assembly and Adjustment Training” is a compulsory basic electronic technology training course for undergraduates majoring in electrical and Information Engineering in our college. It is a practical and applied course. It is different from the study of conventional theoretical courses and experimental courses, and can integrate multiple courses into teaching and learning. It is a course that enables students to grasp basic theoretical knowledge better, to use the knowledge flexibly, and to cultivate students'engineering design and assembly debugging ability. The training content and difficulty of this course cover different levels of practical teaching requirements. It is different from the previous forms of practical courses. It arouses students'strong curiosity and interest, strengthens their learning initiative, and obtains basic theory, basic knowledge and basic skills in electronic assembly and debugging, and establishes the assembly and debugging of electronic products. Basic engineering consciousness and concept.

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