Exploration of the Practical Teaching Reform on MSP430 Development Platform

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Abstract. Practice for different grades of teaching applications, targeted, multi-level students to conduct innovative training will learn the knowledge, capacity-building and teamwork Tuan organic combine to enhance the overall quality of electronic information engineering students, to cultivate students’ creative ability to provide a way.

Introduction

Electronic and Information Engineering belongs to the wide caliber of professional services in the community and more industries. The creation of professional school number, service areas are quite different, because the history of the different institutions, there will be relatively large differences in personnel training mode and curriculum system setting aspects. For a long time, teaching methods, most schools pay attention to the dissemination of knowledge, neglect of engineering practice, likely to cause students to be complacent rote knowledge, there is little opportunity for reflection and innovation, lack of awareness of the project, employment is weak. The Ministry of Education has repeatedly stressed that professional education to the needs of society as a guide to practical engineering background in engineering technology as the main line, students focus on engineering and practical ability to create education model with Chinese characteristics.

In order to improve students' practical ability and engineering consciousness, Electronic and Information Engineering Beijing Institute of Clothing in discipline construction in continuous exploration, education model is also a gradual transition from a simple theory of education to cultivate the ability of practical application. To be able to train with a solid foundation for high-quality talent and innovative thinking and project management capabilities, Electronic and Information Engineering has done a lot of work: first-year undergraduate students began to make effective electronic engineering practice base, set up Aduino electronic creative courses for undergraduate students in the lower grades are interested in electronic and informational knowledge, willing hands to practice. Students organize students to participate in various academic competitions each year, so that undergraduate third and fourth grade of heartfelt love their profession, and have the opportunity to play to their creativity.

After much research and discussion, we decided to use Texas Instruments MSP430 microcontroller development platform to the platform as the core, into Practice Teaching Reform of Electronic Information Engineering, the desired engineering students and practical ability through the internet.

MSP430 MCU Development Platform Introduction

Since the launch of TI's low-power MSP430 microcontroller since, MSP430 microcontroller with its superior performance, rich peripherals, easy entry features, the electronic information industry much attention. High cost makes the MSP430 MCU MCU has other incomparable advantages in cost. Its scope of application can achieve a variety of electronic equipment operation, covering machinery, electronics, control, pneumatics, automotive, energy and robotics. Integrated development platform within the multiple-chip analog peripherals, to facilitate students to their own hands to build the
system, but also a variety of sensors can be flexibly configured components to achieve the system developed under MSP430 MCU control.

**MSP430 MCU Platform Application Development on the Basis of Teaching**

For undergraduate students in the lower grades, the Electronic and Information Engineering is a new object, it does not know what to do. Although also Freshmen professional education each year, but they are more concerned about the future of the profession to find good work it? PubMed situation? Only a few students in high school to professional understanding of electronic information, the final result is in accordance with the University School of Information Studies basic course, suddenly entered the basic course (for example, circuit theory, digital circuit theory, etc.), I feel very confused. In student exchanges, the most heard comments that the profession is very difficult, they do not know can do. We INSTITUTE view of this situation, the creation of practical courses based on MSP430 microcontroller development platform, the purpose is to guide the engineering practice started, to enable students to use their expertise to make it yourself a few simple things, through basic practical aspects, to understand the open back professional basic courses and specialized courses, are the big electronic information system is an indispensable part, to improve students' knowledge of the understanding of the structure.

In the course opened on the basis of practice, we use a simple entry MSP430 development platform, knowledge intensity and high interest to attract the attention of younger students, teaching content to target-oriented module, a design conceived by a try - complete engineering education model, will learn the knowledge, capacity-building and teamwork combine organic.

In practice MSP430 microcontroller based curriculum, the learning process is divided into three stages:

For the first, MSP430 microcontroller basics learning phase. Familiar with the basic electronic components, electrical components and sensors, microprocessor MSP430 understand the basics, the process to explain the common electronic system design, the various components in electronic system applications, electronic and computer technology to develop basic language.

For the second, the training project stage. The teacher in advance for students to prepare a few questions, encourage students to accumulate the previous stage of training, change and innovation on the topic. Since many students are not learning courses, so the design and model building process, teachers should pay more guidance and inspiration in the electronic control, sensor technology and programming, so that students understand that knowledge is useful for subsequent specialized courses of study lay a good foundation.

For the third, the course summary stage. Each submission based on MSP430 platform of creative works. It may not be limited to the subject, to learn knowledge and MSP430 MCU as the core, to build electronic creative work, to improve the ability of students to apply their knowledge and promote their learning initiative. Students MSP430 microcontroller based curricula for learning, self-learning initiative to improve, but also willing to take the initiative to think, actively explore and research, a new professional awareness and understanding. Students agreed that the practice based on MSP430 course changed their fear of difficulties on engineering technology, feel relaxed and lively form of classroom teaching, is indeed a benefit.

**MSP430 Microcontroller Development Platform in Innovative Practice**

For undergraduate Third, fourth grade student, because you have learned some professional courses, training courses and have MSP430 microcontroller development, combined with the National Electronics and Beijing Electronic Contest for interested students have the ability to encourage their active contest. Our school for many years to participate in the electronic competition honors the past five years, Beijing has won the first division. Due to the high specifications and importance of National Undergraduate Electronic Contest, we have to ensure the continuity of student learning, students actively simulation game, students optimization, repeated discussions, model
building, model improvement capabilities. So that students' comprehensive ability in knowledge, engineering awareness, teamwork ability to exercise, innovative consciousness and ability has been further improved. Not only require students to have good ideas and good work instructions, but also the scene of resourcefulness, ability to communicate with people and eloquence, all of which improve the overall quality of students have great help section.

Taking into account the senior undergraduate students in the future to face the problem of employment, how to mobilize their enthusiasm, so that they participate in the Undergraduate Electronic Contest, learn more useful new technology. We also do a lot of attempts. For example: using environmental parameter measurement and control system controller in FPGA to do, students can improve FPGA programming techniques; use Arduino to build wireless monitoring systems, various sensors installed in the system, using wireless Bluetooth various sensors and various actuators combined and transmitted to the mobile communication device to better interact and control, intelligence and interest in wireless control of the control of the student, very much like the type of project. Students through innovative practice activities to stimulate students' intrinsic driving force to mobilize their initiative, self-awareness and enthusiasm, creativity and imagination play, cultivate students' creative thinking and innovation.

Summary

Application of MSP430 MCU development platform for electronic information engineering process of teaching practice, students of different grades and different requirements, and ultimately achieving students can use basic MSP430 monolithic integrated mechanism, sensor technology, electronic system design, and programming technology. For students to create a good system and environmental practices, creative, and guide students' independent learning, theoretical knowledge into practice, give full play to the students, the ability to train students in all aspects. MSP430 microcontroller using electronic information engineering practice teaching reform, improve the overall quality of our school students Electronic and Information Engineering, is an effective way to train students to explore innovative ability.

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