

## Research on the Cultivation of Innovative Ability of Students

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**Abstract.** The selection of innovative talents and the cultivation of their abilities are the process of selecting and training excellent talents through scientific and reasonable teaching and practice system.

Every odd-numbered year has a national college students' electronic design competition, which has the following characteristics:

The National College Students' Electronic Design Competition is one of the University Students' Subject Competitions initiated by the Ministry of Education. It is a mass scientific and technological activity for college students. Its purpose is to promote the reform of the curriculum system and content of information and electronic subjects in Colleges and universities, to help colleges and universities implement quality education, and to cultivate students' practical and innovative consciousness, basic abilities and Humanities of teamwork. The study style of integrating spirit and theory with practice is helpful to cultivate students' engineering practice quality and improve their ability to design and manufacture electronics for practical problems. It is also helpful to attract and encourage young students to take part in extracurricular science and technology activities and create conditions for outstanding talents to stand out.

The characteristics of the National Undergraduate Electronic Design Competition are closely combined with the curriculum system and curriculum content reform of related specialties in Colleges and universities, in order to promote the teaching, teaching reform and laboratory construction of the course. The characteristics of the competition are closely combined with the construction of the style of study combining theory with practice. The contents of the competition include both theoretical design and practical production, in order to comprehensively test and strengthen the theoretical basis and practical innovation ability of the students participating in the competition.

### Objectives and Significance

The National College Students Electronic Design Competition has been held for eight consecutive sessions since 1993. Since 2007, our college has organized students to participate in the national competition every two years, and achieved good results. Since 1993, the number of participants and universities has been increasing year by year. Electronic contest has gradually become an important teaching practice content of electronic information and computer specialty. It has become a distinctive competition mode for University students. It has effectively promoted the educational and teaching reform of participating universities in many ways, gained rich experience and won wide acclaim from the society.

These well illustrate the important role of electronic design competition in innovative education of electronic information specialty and computer specialty in Colleges and universities.

The selection of innovative talents and the cultivation of their abilities are the process of selecting and training excellent talents through scientific and reasonable teaching and practice system. The selection of innovative talents and the cultivation of their abilities are based on the common cultivation, through the construction of a variety of training modes, the formation of personality training. Therefore, we should adhere to the principle of student-oriented and personalized training, fully respect the differences of students' personality, interests, hobbies, abilities and expertise, and teach students in accordance with their aptitude. It is necessary to

systematically carry out comprehensive quality education, professional awareness education and innovative thinking education for students in the academic atmosphere and environment closely combined with teaching and scientific research, further strengthen the training of scientific and technological practical ability and creative ability, select and cultivate excellent innovative talents in learning and practice and cultivate their abilities.

Electronic contest is a good experimental platform. Through the exercise of electronic contest, students' practical ability and innovative ability can be trained. Because each topic of the electronic contest has been carefully selected by the national expert group, which represents the current direction of the development of electronic information and plays a guiding role in our research. Every year, the topics of electronic contest are relatively new. Take the electronic contest in 2013 as an example, for the control category, the topics are "inverted pendulum", "four-rotor aircraft". For the high-frequency category, the frequency has been increased to more than 100M. This is a challenge for both teachers and students. In order to use the basic knowledge we have learned to solve the more advanced and difficult problems, we must have innovative thinking ability, profound theoretical foundation and comprehensive application ability of knowledge.

At present, colleges and universities have established corresponding mechanisms, and are actively exploring how to improve the teaching level of colleges and universities through electronic competitions, and how to deepen the teaching of practical courses and curriculum system settings. For our school, the positive exploration in this field will certainly promote the reform and development of our theoretical and practical teaching. It plays an active guiding role in the revision of curriculum system and syllabus and promotes the cultivation of students' abilities.

## **Thoughts and Methods**

The research methods are from shallow to deep and step by step. The specific operation should be based on theory, practice and ultimately achieve the goal of independent innovation.

The overall construction idea is to take the electronic contest as the opportunity and platform to train students' innovative practical ability through project training. The establishment of interest groups in electronic design is also an important position for organizing practical teaching. In order to strengthen practical teaching links and electronic experimental courses, the school has invested a lot of funds and strengthened the construction of interest groups in electronic design. Now the laboratory has been preliminarily built and equipped with some advanced instruments and equipment. While training and selecting excellent students, the laboratory can also try to set up many electronic experimental courses, course design and graduation design tasks for undergraduates and higher vocational students, and undertake students' extracurricular electronic production guidance and various electronic design competitions and training tasks. Through this platform, teachers' scientific research ability can also be improved. On this basis, the school has set up "school-level and provincial innovative training projects", which are declared by experienced and research-competent teachers, while absorbing students to participate in daily training. From this we can see that the school attaches great importance to the electronic contest, and has given great support to it.

## **Primary Coverage**

In order to select innovative talents and cultivate their abilities, we must understand some basic conditions that innovative talents should possess.

1.1 The basic qualities and abilities that innovative talents should possess:

- 1) Strong sense of career and social responsibility;
- 2) Strong desire for knowledge and perseverance in research;
- 3) keen observation and analysis ability and efficient self-learning ability;
- 4) Broad vision and wide expertise;

1.2 The Comprehensive Qualities of Instructors

- 1) Take teaching and educating people as the basis, and guide students correctly in ideology;

- 2) Excellent business ability and extensive knowledge, can effectively guide students;
- 3) Good personal charm, can carry on the thorough thought exchange and the personality influence to the student;
- 4) Strong professionalism and dedication is an example for students to learn.

### **Summary**

The selection of innovative talents and the cultivation of their abilities are the process of selecting and training excellent talents through scientific and reasonable teaching and practice system. The selection of innovative talents and the cultivation of their abilities are based on the common cultivation, through the construction of a variety of training modes, the formation of personality training. Therefore, we should adhere to the principle of student-oriented and personalized training, fully respect the differences of students' personality, interests, hobbies, abilities and expertise, and teach students in accordance with their aptitude. It is necessary to systematically carry out comprehensive quality education, professional awareness education and innovative thinking education for students in the academic atmosphere and environment closely combined with teaching and scientific research, further strengthen the training of scientific and technological practical ability and creative ability, and select and cultivate excellent innovative talents and their abilities in learning and practice.

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