

# **Practice and Exploration of Science and Technology Innovative Activities and Innovation Education of Science and Engineering Students in Universities**

Xiaochang Li

*Southwest University, College of Engineering and Technology,  
Chongqing, 400715, China*

## **Abstract**

University students as the backbone of the country's future and hope, in addition to strengthening the professional skills training, it also needs to enhance their ability to innovate. The future development of the country needs innovation, and the cultivation of innovation depends on education. In order to enhance the scientific research ability of students, we should actively encourage the college students to carry out rich and colourful scientific and technological innovation activities in practice. The paper analysis the related issues of science and technology students in academic science and technology innovation activities and innovation education.

*Keywords: colleges and universities; science and technology; science and technology innovation activities; innovative education; practice; exploration*

## **1 Introduction**

One of the important ways to cultivate the innovative ability of college students is to carry out the innovation activities of extracurricular academic science and technology. The most important component of cultivating students' innovation ability is the extension and development of classroom teaching. The cultivation of high - quality talents in science and engineering needs to create a strong campus academic atmosphere, which is a prerequisite for its activities. For the

development of innovative talents in colleges and universities, it can not only improve the quality of college students, but also guide and inspire them to explore, assiduously study and pursue the truth, which is of great significance to cultivate academic science and technology and discover talents of innovation and entrepreneurship.

The rapid development of national science and technology to the needs of today's society has undergone tremendous changes in talent. The goal of higher education talent training has also changed to cultivate high-quality scientific and technological innovation talents. In addition, the "National Medium and Long-term Education Reform and Development Plan (2010-2020)" pointed out: "follow the laws of education and talent growth, deepen the reform of education and teaching, innovative teaching methods, explore a variety of training methods, Talented people, top-notch innovative talent emerging situation. " This shows that higher education in addition to pay attention to students in practice to find and develop innovative ability, but also to its comprehensive development, creating innovative talents. Pay attention to the cultivation of applied talents, in order to achieve the country's current demand for talent targets [2].

In recent years, colleges and universities will improve students' innovation ability as the training core. And increase the system and hardware facilities construction reform. So that students of innovative thinking and learning ability to stimulate, and to mobilize students to participate in scientific and technological innovation initiative. At the same time, through the implementation of academic and technological innovation activities and innovative education, students in practice to improve the creative thinking, and enhance the sense of innovation and entrepreneurship, so as to achieve the students scientific and technological innovation and practical ability to enhance the purpose. The research results of students' scientific and technological innovation activities are also emerging, which promote the all-round development of college students and enhance their social competitiveness.

## **2 The status of academic science and technology innovation education of science and engineering students**

### **2.1 Students' participation is not high, the teaching philosophy is traditional**

Under the traditional educational concept, the students of science and engineering in colleges and universities have a large number of passive learning situations. Only pay attention to scores and ignore the application of knowledge, lack of innovation. Although the current university also holds a lot of science and engineering disciplines involved in the innovation competition, but the participation of students is not high. Because students do not know enough about scientific and technological innovation, the time and effort is not enough, the focus of learning is still in the accumulation of knowledge. In addition, the teacher's teaching is still in the traditional mode, most of the focus on the transfer of professional knowledge, not the students' innovative thinking ability to

develop and expand. Only pay attention to the common and ignores the core characteristics of innovation ability that the individual differences of uniqueness. Not conducive to the cultivation of students' innovative ability and personality development.

## **2.2 The Science and technology innovation education system is not perfect**

Because of the late start of China's science and technology innovation education, the system of science and technology innovation education is not perfect, the scope of popularization is small, and the funds of scientific research are mainly limited by the state allocation, which makes the students' scientific research activities severely limited. Coupled with the expansion of science and engineering professional, laboratory and equipment is far from meeting the needs of students, but can not maintain large-scale research projects and scientific and technological innovation activities.

## **2.3 The guidance of professional teachers is not enough**

At present, there are two major problems in the innovation and scientific research activities of the students of science and engineering. First, they do not know enough about professional knowledge and do not have rich practical experience. Second, the level of innovation awareness and attention to the level of scientific research is uneven to give students guidance and help also has limitations. This causes students to carry out scientific and technological activities when there is no innovative initiative and enthusiasm, and unwavering will, often halfway to the situation, so that the scientific and technological content of innovative topics and the success rate significantly reduced.

# **3 Practice and exploration of science and technology innovative activities and innovation education of science and engineering students in universities**

## **3.1 Expand the implementation ways to improve students' participation**

Knowledge economy and scientific and technological revolution need to set up the Innovative Educational Idea of Sustainable Development. Actively Expand Multi - level Students' Innovative Activities. Colleges and universities can set up "Science and Technology Innovation Festival", and vigorously support students to carry out a series of scientific and technological innovation activities. It will improve the students' employability and entrepreneurial capacity as the primary goal of scientific and technological innovation activities, while making the activities more attractive and shaping.

### **3.2 Establish a professional teachers team**

"100 years of planning, education-based; education plan, teacher-centred", you want to enhance the quality of academic science and technology innovation activities, the need for the introduction of more professional teachers. In the university academic innovation education, teachers should innovate the content of education, the curriculum system optimization, not only to teach students the knowledge of teaching materials, but also to guide students to develop thinking. To enable students to keep abreast of the latest technological innovation information and the forefront of professional development of science and technology, and actively support students in the classroom during the time of academic research, independent experiments or teachers to participate in research projects. In addition, teachers can organize students to actively participate in all kinds of different levels of academic science and technology innovation activities, so that students of personalized training, professional development provides a basic platform, and to students' innovation and entrepreneurship, hands-on practice capacity and overall quality of the purpose of improving.

### **3.3 The policy protection to implement students' science and technology innovation**

Colleges and universities should develop and improve a series of student science and technology innovation system. For example, student achievement points, credits found, scientific research findings, incentives and so on. This can mobilize the enthusiasm of the students to participate in scientific and technological innovation activities to a maximum extent, and guarantee the students' scientific and technological innovation projects and practice training. In addition, you can rely on science and technology competition to promote innovation activities. Discovering and cultivating students and instructors with scientific and technological innovation spirit and innovative strength.

### **3.4 Carry out research teaching**

At present, colleges and universities will be "people-oriented, full of people, the pursuit of excellence" as the spirit of the campus guide. The cultivation of students' innovative ability also needs to reflect this spirit. To create a good experimental teaching scientific research and training environment, and continue to increase the design, synthesis, research, innovative experiment ratio. At the same time in the classroom to encourage students to the same experiment proposed different experimental methods, ideas, to support students to the laboratory for research design and implementation of research and development, the greatest degree of inspire students' enthusiasm for scientific research, learning interest and innovation entrepreneurial consciousness. At the same time, the students' ability of literature retrieval, hands-on practice, research ability, learning ability, communication and coordination ability and innovation and creation ability have also been improved obviously and the comprehensive quality of research has been on the rise.

### **3.5 Build personalized training platform**

Students can choose their own research projects and design research routes, you can also choose to participate in research projects and teachers under the guidance of teachers to carry out relevant research, research projects and the practice has been affirmed by experts to reflect the colleges and universities in scientific and technological innovation In the process of the training of innovative talents is successful, or organize students to participate in various types of academic and technological innovation activities, this will not only help promote the exchange of university students, research, exploration, but also for students to self-study, self-help , Innovative learning needs to be fully met. In addition, the practical ability of the curriculum system is optimized, highlighted and strengthened, so as to create a good platform for the cultivation and improvement of the students' innovative and practical ability in the universities.

### **3.6 Establish the educational management mechanism**

The science and technology innovation work of university science and engineering students is a systematic project involving teaching, scientific research and management. The organization and management team construction is the prerequisite to carry out scientific and technological innovation activities in colleges and universities. At the same time, we must strengthen the propaganda work, the maximum coverage of relevant policy information, so that all teachers and students to further determine the science and technology students in science and technology innovation ability of social practical significance. According to the background of science and engineering disciplines and the actual situation of colleges and universities, combined with information, materials, biology, environment and other superior disciplines, disciplines, types, hierarchical structure optimization, and develop optimization plans and training strategies.

### **3.7 Establish practice base of college students' innovative quality education**

Undergraduate internship base is the scientific research institutes, enterprises, universities and government departments to invest human and material resources to build the product. Practice base which includes more entrepreneurs and winners, their experience and experience are in practice, the knowledge is relatively vivid, fresh, and theoretical knowledge and the formation of a complementary relationship between. In order to be able to solve the relationship between practice and theoretical teaching, practice base highlights. Students can use this platform to actively participate in the research and development, production and sales of different links, in practice, feel the law of market operation, to master their own innovation, business management and entrepreneurial skills, so as to better integrate the various Platform. Students can also use this platform to understand the relevant fields of professional research, especially the more economic information, so that students further develop their horizons, inspire their innovative inspiration.

#### **4. Conclusion**

In summary, the university science and technology academic and technological innovation activities can not only help students stimulate innovation, but also enable students to enhance self-confidence and broaden their horizons in the process of innovation. This can help them accumulate experience to solve the difficulties encountered after work and it also adds a number of applications and complex high-quality scientific and technological innovation talents for the country. It not only has the characteristics of strong pertinence, wide coverage and remarkable practical effect, but also has distinct characteristics. It has great reference value and popularization value in the training of innovative talents.

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