



# Combining of Scientific Research with Classroom Teaching to Cultivate Innovative Students

Xuecheng Liu<sup>1</sup>

College of Mathematics and Statistics, Taishan University, 271000, Tai'An, ShanDong, China

Email:controllxc@126.com

**Abstract**—Scientific research activities in colleges and universities complement the cultivation of innovative talents. The essence of scientific research activities is the process of cultivating innovative talents and promoting each other. Scientific research activities in colleges and universities play an important role in the cultivation of innovative talents. Therefore, the combination of scientific research and classroom teaching is conducive to cultivating students' innovation.

**Index Terms**—Scientific research; classroom teaching; innovative talents; culture

## I. INTRODUCTION

The goal of higher education is to cultivate high-quality talents who can meet the needs of the times, have innovative consciousness and innovative spirit. Curriculum construction is not only the key point of the teaching system of colleges and universities, but also the carrier of higher education. It is the key link to determine what kind of talents to cultivate. Therefore, to cultivate innovative talents, we need to carry out curriculum innovation construction.

## II. CHARACTERISTICS OF INNOVATIVE TALENTS

Since the government put forward "implementing quality education and cultivating innovative talents" to the national educational circles, colleges and universities all over the country are facing the problem of talent training, that is, from service-oriented talents to innovative talents. Compared with service-oriented talents, innovative talents have the following characteristics:

1) Innovative talents with new knowledge structure should have direct knowledge and indirect knowledge. Indirect knowledge is still taught to students by teachers; direct knowledge is the knowledge obtained from teachers and students. The important thing is to cultivate students' ability to acquire knowledge and explore new unknown knowledge.

2) The basic thinking of innovative talents is forward thinking and converse thinking. On this basis, critical thinking can be developed. Students can use critical thinking to learn and improve their resolution ability.

3) The new ability structure requires students to find problems, put forward problems, analyze problems and solve problems. These four abilities constitute the basic abilities of innovative talents. Being good at finding problems and daring to ask questions is not only an important quality of innovative

talents, but also an important symbol different from service talents.

4) In different training processes, service-oriented talents emphasize commonalities and can be cultivated in batches. Innovative talents emphasize individuality and require personalized education. Create a free and relaxed learning environment in the school, so that students can really learn independently according to their interests, hobbies and specialties, teach students according to their aptitude, and train excellent students. Cultivating service-oriented talents only needs a simple teaching process, teachers' systematic teaching and students' systematic learning. The cultivation of innovative talents is two processes, the teaching process and exploration and research process. In the past, there were two types of teachers in Colleges and universities. One was teaching and the other was scientific research. Teachers who have been engaged in teaching for a long time have no time to engage in scientific research, lack the accumulation of new knowledge at the forefront of scientific research, and the teaching content is difficult to update. Teachers who do well in scientific research never undertake the teaching of basic courses, resulting in the disconnection between teaching and scientific research, which is very unfavorable to the cultivation of innovative talents. The No. 4 document issued by the Ministry of Education requires all teachers to undertake undergraduate teaching tasks, which is a sagacious measure.

## III. THE RELATIONSHIP BETWEEN SCIENTIFIC RESEARCH ACTIVITIES IN COLLEGES AND UNIVERSITIES AND THE CULTIVATION OF INNOVATIVE TALENTS

### A. *The process of scientific research activities is essentially the process of cultivating innovative talents*

The integration of the cultivation of innovative talents and scientific research is the inevitable trend of the development of colleges and universities. The cultivation of innovative talents belongs to the cultivation of high-level talents. The cultivation way can only explore high-tech knowledge through scientific research activities. In the process of scientific research activities, cultivating the quality and skills of scientific research through the combination of scientific and technological theory and practice, to achieve high academic attainments and strong scientific research ability, is



also the goal of innovative talent training. Otherwise, it will be empty talk to talk about the cultivation of innovative talents without scientific research.

*B. Scientific research promotes the cultivation of innovative talents, and the cultivation of innovative talents drives the development of scientific research*

The cultivation of scientific research and innovative talents promote each other and complement each other. Generally speaking, the ability of scientific research with large scale and high level to cultivate innovative talents is stronger. Firstly, through the cultivation of scientific research ability, scientific researchers continue to innovate, explore new disciplines, change their way of thinking, create new disciplines, determine the development direction, gradually build an innovative knowledge structure and an agile and innovative way of thinking, be good at observation, thinking, analysis and synthesis in scientific research practice, and constantly create new laws, new principles, new effects and new technologies of new disciplines, make yourself an innovative talent. Secondly, with the professionalism of enterprising and striving, they will continue to explore new research directions and research fields through endless professional and in-depth development; and drive the development of scientific research. Therefore, scientific research in colleges and universities is not only a means to cultivate innovative talents, but also further promote the development of scientific research ability, bring innovative talents with scientific research achievements, and take the cultivation of innovative talents as a breakthrough to drive the development of scientific research.

**IV. COMBINING SCIENTIFIC RESEARCH WITH CLASSROOM TEACHING TO PROMOTE THE CULTIVATION OF INNOVATIVE TALENTS IN COLLEGES AND UNIVERSITIES**

*A. College students are the main body of innovative consciousness*

Colleges and universities should fully realize that students are the main body of innovation. Due to the limitations of socialization and their own knowledge, students will always have some deviations in their understanding of themselves. Students are more accustomed to the simple acceptance and repetition of knowledge, and lack the courage and will quality of innovation. As a school, we should encourage students' innovative courage and spirit, cultivate students' innovative

consciousness and stimulate students' desire for innovation.

*B. Classroom teaching is the main position to cultivate innovative ability*

Classroom teaching is the main channel for college students to obtain knowledge nutrition and implement the overall quality improvement with innovative ability as the core. It is not only the main battlefield for the combination of scientific research and teaching, but also the main position for cultivating innovative ability. Innovation ability is not a single knowledge ability. It is the embodiment of the comprehensive quality of a person with all-round development. Colleges and universities should focus on the cultivation of innovative ability and give full play to the role of scientific research in classroom teaching.

*C. Extracurricular scientific research activities play an important role in cultivating college students' innovative ability*

Extracurricular scientific research activities are not only an important link to deepen the classroom teaching content and strengthen classroom teaching effect, but also an important way to directly cultivate students' innovation ability. Their activities are very rich, such as contemporary undergraduate mathematical contest in modeling, national "The Challenge Cup" extracurricular academic work competition for college students, etc.

**REFERENCES**

**(Periodical style)**

- [1] H.Q. Zhang "Combining of professional course teaching with scientific research and practice to train creative students," *Research in Teaching*, vol. 31, pp. 436-438, Sep 2008.
- [2] Y.N. Zhao, Y.B. Zhang, "Innovative talent training approach combining experimental teaching and scientific research," *China Electric Power Education*, vol. 147, pp. 143-144, Oct. 2009.
- [3] C.X. Hou, X.D. Tang, "Combining scientific research practice with classroom teaching to cultivate innovative talents," *Journal of Higher Education*, vol. 16, pp. 24-16, Aug 2018.

**AUTHORS' PROFILE**



**Xuecheng Liu** is a lecturer. He obtained his first degree of Bachelor of Management at the University of Jinan and Master of Science Degree at GuiZhou University. His major fields of study are Network Information Security.