

# *The Integration of Laboratory Teaching and Research in Universities on the Cultivation of Innovative Talents*

**Liu Shijian**

*Krirk University, Bangkok, Thailand*

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**Abstract:** Training innovative talents is an important responsibility of higher education, which is helpful to transport more high-quality talents for the society and promote the healthy development of society. Through the analysis of the current situation of talent training in university laboratories, this paper puts forward the main countermeasures for the integration of teaching and research in university laboratories, and trains more innovative talents by strengthening laboratory construction and management, so as to help strengthen laboratory management and construction and promote the improvement of talent training quality.

## **1. Introduction**

The stable development of social economy promotes the progress of science and technology, and the competition for talents is becoming increasingly fierce. The key to the future development of the country and the great rejuvenation of the nation depends on talents, and the foundation is education construction. An innovative country needs to cultivate innovative talents with both virtue and talent. Therefore, in the process of education, colleges and universities bear the important responsibility of teaching and educating people and cultivating innovative talents for the society. In order to effectively cultivate innovative talents, it is necessary to ensure that talents have innovative spirit, innovative ability and comprehensive quality. At the same time, the development process of higher education should be recalled by relying on the laboratory to provide the foundation according to the integration mode of teaching and scientific research in universities and colleges. Promoting the effective integration of laboratory teaching and scientific research, improving laboratory construction is an important way to train innovative talents, and developing more targeted education measures to improve the effect of talent training to meet the needs of society for talents.

## **2. The effect of integration of teaching and research on improving the training quality of innovative talents**

As the common development goal of higher education, the training of innovative talents faces arduous tasks in this regard. The universities of our country need to undertake their own tasks according to the situation of different levels of higher education, especially in view of the gap in the level and quality of running a school. As a serious problem, the correct educational concepts need to be established. The development of quality education should be avoided by the factors of backward

teaching concept and the achievement of which method. Moreover, whether students can adapt to society and employment is relatively important, and there will be problems if the teaching system is not perfect. In order to achieve reliable education, comprehensive analysis should be carried out based on the current situation of talent training, continuous summary of experience, full understanding of the current situation of talent training, strengthening the integration of teaching and scientific research, so as to become the propeller of innovative talent training. Through the formulation of a more targeted talent training model, talents can be guided to actively participate in scientific research, so that the knowledge learned in the classroom can be scientifically utilized, the integration of theory and practice can be strengthened, the separation of teaching and scientific research can be avoided, and students can adapt to modern development <sup>[1]</sup>.

### **3. Analysis of university laboratory status**

#### **3.1 Separation of teaching and scientific research**

In the organization of scientific research and teaching work within universities, there are usually institutional barriers, which lead to a serious separation between scientific research and scientific innovation work and talent training to a certain extent. Meanwhile, even if universities have set up the integration of teaching and scientific research, teachers belonging to specialized research institutions can only have less time and energy to undertake teaching tasks. The promotion performance assessment of university teachers pays more attention to the achievements of scientific research, which leads to the decrease of the enthusiasm of personnel training and education to a certain extent. At the same time, the independence of teaching and scientific research in resource allocation leads to the poor training effect of innovative talents in universities.

#### **3.2 Disconnect between theory and practice**

University laboratories are an important area for the transformation of scientific research results and scientific and technological research. However, laboratory resources in some universities are relatively limited, and experimental technicians cannot timely understand the development trends of technology in professional fields. Some researchers do not timely integrate the transformation of results into experimental teaching, so teaching content and experimental technology cannot be unified. This not only affects the smooth progress of all aspects of laboratory work, but also seriously disconnects theory and practice, which will have a certain impact, which is not conducive to the improvement of talent training effect, and even involves more links that are difficult to meet the needs of innovative talent training <sup>[2]</sup>.

#### **3.3 Resource sharing is not high**

The laboratory construction funds come from multiple channels such as professional scientific research and talent introduction, involving multiple departments of university development, which are not coordinated enough and communication is not smooth enough. Most of the laboratory resources have high efficiency, but the laboratory fails to meet the needs of students' exploration and practice with low-end teaching resources, and there is no scientific and technological innovation. As a result, the overall teaching form is not optimistic enough, and the sharing degree of scientific research resources is low, which is difficult to meet the needs of talent training.

### **3.4 No talent echelon training mechanism has been formed**

Laboratory scientific research requires teamwork, and it is impossible to evaluate teachers' individual contributions. At the stage of professional title evaluation, it is relatively difficult for teachers with relatively weak scientific research ability to be promoted, and scientific research projects and papers are important work in professional title evaluation, which will lead to the shift of the focus of work of some teachers to scientific research, and practice becomes an important development direction for teachers. Seriously affect the quality of education and teaching.

### **3.5 Laboratory system management problems**

The management of the laboratory did not fully implement the principles of professional management, it did not adhere to the perspective of task scale and function in the setting up of the laboratory, and the setting of the laboratory was relatively arbitrary, lack of planning and management of the laboratory, the management department and the college adopted a loose management mode for the laboratory, lack of specialized management personnel, and it was difficult for the members of the section to carry out unified supervision. Laboratory environment and safety problems are more common, many policies cannot be fully implemented, which will not only affect the utilization of laboratories, is not conducive to the cultivation of innovative talents.

## **4. Countermeasures of university laboratory teaching and research integration construction**

### **4.1 Establish the concept of system management and integrate the superior resources of professional disciplines**

The integration of laboratory teaching and research in colleges and universities is a necessary work, and it is necessary to plan key work in accordance with the actual situation of the school, such as establishing the concept of systematic management, strengthening the overall planning of the laboratory, doing a good job in overall management, attaching importance to the systematic management of the laboratory in accordance with the requirements of the scientific concept of development of comprehensive and sustainable development, and combining multiple links such as decision-making construction and cost operation management. Colleges and universities should carry out systematic coordination, improve the quality of personnel training and plan the benefits of scientific research<sup>[3]</sup>.

Colleges and universities should take the cultivation of innovative talents as the goal to promote the integration of laboratory resources, integrate teaching quality into the goal of discipline construction, make good plans to teach with excellent scientific research results, promote the improvement of teaching level by improving laboratory conditions, improve laboratory environment and experimental means in the construction stage, and scientifically penetrate modern technology into experiments. Through optimizing the way of reform and adjustment, integrating professional and advantageous resources, improving the effect of the integration of teaching and scientific research on the current basis, so that the training effect of innovative talents has been greatly improved.

### **4.2 Adjust the teaching and research management system**

As a necessity, the integration of teaching and research in university laboratories should pay attention to innovation in the reform of teaching management system, provide a good institutional environment for the training of innovative talents, support students' scientific and technological

innovation and practice, provide students with personalized training measures, and constantly expand space so that students can grasp more knowledge in learning. For the innovation of the scientific research management system, in order to ensure the effective integration of scientific research work and talent training, it is necessary to optimize the discipline, carry out reforms on the current basis, promote the transformation of scientific research results, create a better environment and atmosphere for the training of innovative talents, and enhance the overall training effect to play a good role and advantage.

In order to promote the transformation of laboratory resources and results, it is necessary to strengthen and improve various rules and regulations, so that all work has rules to follow, but also should have clear responsibilities, avoid loose management and unreasonable division of responsibilities and other problems, strengthen normative construction, improve the quality of laboratory management, and bring more help to talent training. Especially for the cultivation of innovative talents, it requires a lot of energy. In the talent training stage, comprehensive exploration should be done and standardized control should be carried out through various means, so as to make comprehensive adjustment based on the actual situation, establish more scientific training measures, and provide more help for the subsequent development of talents.

#### **4.3 Take the laboratory informatization construction as the means**

In the context of the continuous improvement of scientific and technological level, the integration of teaching and research in university laboratories has brought some help to the training of innovative talents. In order to effectively realize the innovation of laboratories, it is necessary to take the means of information construction as the basis, ensure the opening and integration of resources through institutionalization and standardization construction, and strengthen the comprehensive information of laboratories by establishing a unified information sharing platform. In addition, by means of book and material resource control, taking private management sharing as the concept and network management as the support, the optimization and establishment of the traditional mode are realized, the operation mechanism of network management is expanded, the level of laboratory resource sharing and informatization is improved, and the foundation is laid for the subsequent training of talents and the improvement of talent ability <sup>[4]</sup>.

#### **4.4 Reform the existing evaluation system of colleges and universities**

The main task undertakers of the training of innovative talents are teachers. In order to effectively adapt to the situation, the training of innovative talents requires colleges and universities to implement reforms in the construction of the teaching staff. It is not only necessary to take the overall scientific research and scientific and technological innovation ability of the teaching staff as the main position, but also to take the training of innovative talents as an important task and strive to improve the comprehensive ability of scientific research and teaching. In the education stage, teachers should pay attention to reform in combination with the scientific research projects they undertake and the production design projects, establish an experimental teaching system based on the cultivation of comprehensive ability, introduce the advantages of scientific research into actual teaching, guide students to participate in scientific research activities, and master more knowledge in the activities, improve the overall educational value, and bring more help to talent training. We will continue to improve the quality of training innovative talents.

#### **4.5 Build a talent training system integrating teaching and scientific research**

Training innovative talents needs to build a matching training system, especially in the

background of education reform, China's higher education has always insisted on promoting education reform, and has obtained rich experience results, but cannot fully meet the needs of innovative talents training. Therefore, in the process of education, it is necessary to analyze the overall experience in combination with the objectives of teaching reform, and reconstruct the mode of training innovative talents through a complete training system. As an important task of education and teaching reform, we should take the talent training system as the basis, constantly cultivate talents, and take the system construction as the basis to enhance the reliability of reform education and promote the reform of education. The purpose of the reform is to adapt to the integration of education and research, and to provide a high-quality resource environment for undergraduate and graduate students.

In the training stage of innovative talents, teachers need to combine scientific research and teaching and combine them with the new knowledge system. Science and technology are changing rapidly, and modern colleges and universities need to have both the functions of knowledge imparts and knowledge innovation. Teachers need to devote themselves to scientific research and integrate the knowledge acquired from scientific and technological innovation activities into the curriculum system, so as to achieve solid accumulation. Teachers use innovative thinking of science and technology to guide and cultivate students' ability to acquire knowledge and solve problems. In addition, under the current background, personnel training as the core plays an important role in the process of personnel training. It should be optimized based on the actual situation, and make improvements on the original basis. By enhancing the overall training effect, it should further optimize personnel training in strict accordance with educational essentials, so as to avoid the failure of integration of teaching and scientific research caused by traditional education methods. The school should create a good scientific research environment, improve the overall training effect, and play the necessary role and advantages <sup>[5]</sup>.

#### 4.6 Construction of high-level teachers

The integration of laboratory teaching and research in colleges and universities has higher requirements for the quality of teaching staff, so first-class teaching staff should be established to help cultivate innovative talents. Therefore, in the process of introducing and training teachers, colleges and universities should adhere to the integration of education and scientific research as the basis to enhance more learning opportunities for teachers. Through the analysis and exploration of deep-rooted problems, such as teacher evaluation and assessment as the basis, teaching of teachers in research-oriented universities is the basic task, and scientific research level and achievements are the main basis, so it is necessary to adhere to the dual requirements of teaching and scientific research. However, in terms of comprehensive evaluation of teachers' performance, contribution and academic level, rather than purely based on business indicators, teachers should not only teach and educate people, but also engage in scientific research work, which has exploratory periodic assessment and plays the dual role of encouragement and restraint. In the recruitment stage, they need to understand constraints, and not only need to carefully design systems, but also need to understand constraints. At the same time, it is necessary to analyze and grasp the orientation of education policies, improve the educational philosophy of teachers, guide college teachers to have correct ideas, adapt to future development in the process of higher education reform, form a correct education model, effectively reduce the problems faced by traditional education stage, avoid impact, and propose more targeted education measures. The integration of laboratory teaching and research in colleges and universities should promote the reform of education and teaching with high-level scientific research, change the teaching concept and teaching mode, and build an interactive innovative talent training system.

#### **4.7 The incentive of building high water rights is the guarantee**

The combination of teaching and scientific research also has high requirements on the teaching environment. As a guarantee, the construction of a high-level base in a research-oriented university has just started, and the process of shifting from teaching to teaching and research is difficult. Therefore, it is necessary to break through the institutional restrictions, innovate academic organizations, and adapt to the trend of scientific and technological innovation and innovative personnel training. The combination of teaching and research also needs to pay attention to academic organization, innovation and reform, and carry out directional analysis. According to the fact that academic organizations at the grass-roots level are not only directly related to personnel training, but also the importance of the creation of teaching and research activity bases is self-evident, a good environment can revitalize the vitality of scientific and technological innovation, promote more high-level scientific research results, and realize the effective interaction and integration of teaching and research. To promote the development of students with high-level scientific research, it is necessary to explore and innovate the system on the basis of scientific and technological innovation in the construction stage, and greatly help the training of scientific researchers. Only in this way can the academic direction be condensed, the guiding ideology and standards be followed, and it plays an important role in the training and growth of talents.

#### **4.8 Pay attention to the innovation of university culture**

The cultivation system of innovative talents includes the cultivation of humanistic spirit and scientific spirit. Especially in the context of integrated education and scientific research, only students who are interested in scientific research can actively participate in exploration, have a certain innovation ability, and have a sense of social responsibility. Each of the older generation of scientists, such as Deng Jiaxian and Chen Jingrun, has experienced twists and turns in life, and the great success they have achieved comes from their enthusiasm for scientific and technological innovation. Therefore, it is necessary to innovate college culture, which can avoid academic impetuous, academic bubble, academic fraud and other problems. Only by strictly following scientific laws can we help talents master more scientific research knowledge, guide talents to establish correct values, realize the integration of college laboratory teaching and research, and promote educational innovation. Moreover, as a comprehensive process to cultivate innovative talents, it involves more work and is a systematic project, which must be paid attention to in the talent training stage to ensure that reform and innovation can be paid attention to, adapt to future education development, improve the training effect of university laboratory, and avoid being affected by some problems and lead to a decline in training quality.

### **5. Conclusion**

All in all, the level of laboratory construction is an important demonstration of the overall competitiveness of colleges and universities, and strengthening laboratory construction is a long-term work, but also a persistent work. Personnel training is fundamental, and scientific research is the forerunn. Colleges and universities should continuously strengthen the internal construction of laboratories, and transform excellent scientific research results into rich experimental resources, promote the effective integration of higher education teaching and scientific research, train more high-quality innovative talents for colleges and universities. We need to promote the improvement of the training level of college talents, realize the establishment of a better performance hardware environment and software platform, and then transfer more innovative talents to the society.

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