

Research on the construction of open laboratory in universities based on the cultivation of innovative and entrepreneurial talents

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Abstract: University laboratory is not only a place to cultivate students' comprehensive quality and practical ability, but also an important base for innovation, entrepreneurship, education and scientific research ability. The traditional laboratory management model of colleges and universities has many limitations in the cultivation of innovative and entrepreneurial talents. Through laboratory informatization platform sharing mechanism, perfect the laboratory management system, science and technology innovation system construction, university-enterprise cooperation laboratories, to strengthen the construction of experiment teaching staff, reforming the experiment project, measures of financial investment and strengthen the laboratory to ensure open laboratory of colleges and universities to implement, in the innovative entrepreneurial talents play a positive and important role.

1. Introduction

Innovative and entrepreneurial talents are the most important strategic resources for the development of the world economy. Vigorously cultivating innovative entrepreneurial talents has become an important strategic measure for countries to achieve rapid economic development and scientific and technological progress. Colleges and universities in China should vigorously cultivate innovative and entrepreneurial talents and implement innovation and entrepreneurship education. Li Xiaoming divided the development of innovation and entrepreneurship education in China's colleges and universities into four stages in the "Blue Book of Innovation and Entrepreneurship Education in China" (2016): the germination period (before 2002), the exploration period (2002-2008), and the expansion period (2008-2010) and rapid development period (after 2010). China's colleges and universities have made rapid progress in innovation and entrepreneurship education, and a large number of innovative and entrepreneurial talents have emerged^[1]. In 2016, the Ministry of Education announced the first batch of 50 "National Innovation and Entrepreneurship Typical Experience Universities", and in 2017, another 50. With the continuous deepening of "mass entrepreneurship and innovation", the innovation and entrepreneurship education in China's colleges and universities and the teaching reform and research around innovation and entrepreneurship education are also in full swing. Innovative and entrepreneurial talents are the source of innovation and entrepreneurship.

2. The traditional laboratory management model

2.1 Experimental center system, centralized management mode

In order to complete the experimental teaching, colleges and universities use the college as a carrier to establish a laboratory-level experimental training center and set up special management personnel and experimental personnel. The experimental training center includes both the curriculum laboratory and the subject laboratory, and all laboratories are centrally managed and operated in a unified manner. The management mode has the outstanding advantages of in-class experiment opening and running, laboratory management safety specification, responsible for

experimental equipment, timely maintenance and repair, and good environmental hygiene. However, the management mode is generally mechanical, and the laboratory management of each college is independent of each other. Lack of overall planning leads to serious shortage of laboratory opening. Most experimental equipment is idle for a long time, and the utilization rate is low^[2].

2.2 Relying on department, decentralized management mode

The laboratory construction of colleges and universities is mostly divided into departments according to department or profession. The department is responsible for the planning, construction, management, operation and maintenance of the corresponding laboratories. The discipline laboratories planned and constructed by the department are more specialized and systematic. The subject laboratory has the advantages of fast software and hardware update and high utilization rate of subject laboratories. The subject laboratory can be opened to professional students and professional teachers, which improves the utilization efficiency of experimental equipment, and plays an important supporting role in the cultivation of professional students' innovative and entrepreneurial ability and the improvement of professional teachers' research level. However, the degree of openness of this management model is still insufficient, and there is no open system for all teachers, students and society.

2.3 Management mode of centralized management and decentralized management

Some universities' laboratories are managed by a combination of centralized management and decentralized management. The public basic course laboratory establishes an experimental center and centrally manages it; the subject laboratory relies on the department and decentralized management. This management model combines the advantages and disadvantages of centralized management and decentralized management^[3].

3. Build an operational mechanism for open laboratory management

The open laboratory is aimed not only at students, teachers, but also in society; not only to provide an open and relaxed experimental environment, but also to achieve better resource sharing. The application of open laboratory has played a comprehensive role in promoting the professional quality, comprehensive quality, practical ability and innovation and entrepreneurship of college students and college teachers. Therefore, the construction of open laboratories is imperative. The core of open laboratory construction is to improve management level and operational efficiency, promote the coordinated development of teaching and scientific research, adapt to the new situation of innovation and entrepreneurial talent training, establish advanced laboratory management concepts, and establish an effective open management model and operational mechanism. The important direction of the reform and development of university laboratories. The main measures are as follows.

3.1 Build an open laboratory information management platform

The laboratory information management system can ensure that the laboratory implements comprehensive information management and improves the management level of the open laboratory^[4]. The laboratory information management system mainly includes laboratory human resource management, quality management, instrument and reagent management, environmental management, safety management, information management, laboratory setting mode and management system, management organization and function, construction and planning. The application of laboratory information management system in developed countries in the West is relatively mature. Chinese enterprises and colleges are also introducing laboratory information management systems to realize information management.

Through the construction of the laboratory information management system, the use of Internet +, information technology, integration of laboratory, laboratory equipment and other information, to provide laboratory administrators with easy-to-use information viewing and management operations, improve the management level of the laboratory, Improve the laboratory management mechanism;

strengthen the role of experimental teaching in the cultivation of innovative and entrepreneurial talents, provide students, teachers and social personnel with more flexible, more convenient and more efficient experimental appointment operations, provide a good learning and research environment, improve students' Innovative entrepreneurship.

3.2 Improve the open management system of the laboratory

With the opening of the laboratory, the number of students, teachers, and social personnel entering the laboratory will increase greatly, and the number and types of experimental projects will increase greatly. Whether the laboratory can operate efficiently and orderly is the level of laboratory management. Standard. Perfect laboratory rules and regulations are the guarantee for high-level operation of the laboratory. To formulate and revise the corresponding rules and regulations for the comprehensive "openness" of the laboratory, including the "Laboratory Open Management Regulations", "Laboratory Co-construction Regulations", "Laboratory Use Regulations for Foreigners in Laboratories", "Laboratory Safety Responsibility System" and "Experiment Room application system, "laboratory personnel duties", "experimental equipment management measures" and so on.

3.3 Establish a scientific and technological innovation system

In order to train a group of outstanding innovative and entrepreneurial talents, the state, government departments or organizations have carried out a variety of academic competitions for domestic universities, such as mechanical product innovation design competition, electronic design competition, energy-saving emission reduction design competition, "Challenge Cup" contest, E-commerce "innovation, creativity, entrepreneurship" contest. Many competitions have achieved remarkable results in the development of students' ability^[5]. A number of outstanding innovative entrepreneurs have emerged. After graduation, students have shown strong innovative design capabilities. Participating in science and technology competition has become an important way for colleges and universities to train high-level talents. At present, the science and technology competition system still has the limitations of "elite education". Only some students can participate, and it cannot be oriented to the students. Establishing a scientific and technological innovation system, encouraging the participation of more students to participate in scientific and technological innovation activities through the establishment of a science and technology innovation credit exchange system, giving priority to the postgraduate system, and giving priority to the employment system is an important measure for the reform of education and teaching in colleges and universities.

3.4 University-enterprise cooperation laboratories

With the further development of the collaborative education model of industry, university and research cooperation, more and more enterprises and universities have begun to explore the model of school-enterprise cooperation and joint laboratories to achieve the goal of cultivating innovative and entrepreneurial composite talents required by the new era. The school-enterprise co-construction laboratory is an experimental solution built in a real-world application environment, covering the course experiment library and project training library composed of real cases in the industry, providing first-class experiments for teachers and students in teaching, research and competition. Location and hardware and software environment. Cooperative institutions can combine the characteristics of co-constructed laboratories, and use the co-construction laboratory as a platform to carry out various practical activities, allowing teachers and enterprise technicians to cooperate in depth and participate in the construction of the joint laboratory platform to truly realize the experiment. The opening and sharing of room resources will achieve a win-win situation for schools and enterprises.

3.5 Strengthen the construction of experimental faculty

The laboratory faculty directly serves the teaching. They also shoulder the heavy responsibility of education reform and development, and play an important role in scientific research, discipline

construction, and personnel training. The experimental teachers use modern teaching equipment to set the teaching situation, mobilize the students' enthusiasm for learning, enlighten the students' potential, stimulate students' interest in learning, and effectively cultivate students' observation ability, creative ability and innovative spirit. The experimental teacher forms a gradient in terms of title, age and degree. Form a team of laboratory teachers with reasonable structure, strong scientific research ability and high professional skills.

4. Conclusion

The construction of open laboratories is the only way for higher education institutions to cultivate innovative and entrepreneurial talents. Only when the laboratory is truly open can we provide students with an environment of innovative practice and ensure the smooth progress of the innovation practice. The opening of the laboratory requires the sharing of laboratories from the laboratory information platform, the improvement of the laboratory management system, the construction of scientific and technological innovation systems, the establishment of laboratories for school-enterprise cooperation, the strengthening of the construction of experimental faculty, the reform of experimental projects and the strengthening of laboratory funding. In order to ensure the openness of the laboratory construction, we can play an important role in the cultivation of innovative and entrepreneurial talents.

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