

# Research of achievement transformation mechanism for innovation and entrepreneurship of mechanical major in universities

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## Abstract

This paper is based on mechanical specialty, conducted research into machinery for innovative entrepreneurial achievements and analyzed obstacles to its scientific and technological achievements in the process of unfavorable factors. And then on promotion of innovation and entrepreneurship, these transformation initiatives include, in innovation and entrepreneurship base research and development projects, focusing on collaborative research to negotiate with businesses, schools and setting up special office achievements, establishment of science and technology parks, and transfer of patent applications in schools, in order to promote innovation and entrepreneurial achievements mechanical major conversion rate.

## Keywords

mechanical major, innovation and entrepreneurship, achievement transformation, patents.

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## 1. Introduction

Competition of comprehensive national power is actually that of national scientific and technological strength. Most of science and technology development is to rely on scientific and technological achievements of actual transformation, it is to accelerate technological progress, promote economic growth and enhance comprehensive national strength of important link. With continuous development of society, function of university is constantly evolving, in addition to cultivation of innovative talents, but also should have function of scientific and technological innovation, to social radiation knowledge and scientific and technological achievements. Survey found that nearly 70% of world's major discoveries in world's basic sciences were made by universities. Many high-tech industrial parks are built around university, such as famous Silicon Valley, the United Kingdom of Cambridge Science Park, Zhongguancun of China. In addition, some of our country's universities have set up a high-tech enterprises, such as Tsinghua Tongfang and Tsinghua Ziguang of Tsinghua University, Peking Fangzheng of Peking University. They have achieved better economic and social benefits. Transformation of these scientific and technological achievements has made a good example to other universities in this field. But in the face of China's huge land, dense population, gathered in colleges and universities, transformation rate of results and contribution rate of economic development compared with developed countries is very low, which shows that role of colleges and universities in national technological innovation system has not been fully played, as well as to improve [1]. In recent years, with establishment and operation of teaching base of innovation and entrepreneurship education, teachers and students of university have completed some innovative and entrepreneurial projects

independently or together, and enrich research results of university. But only in face of number of scientific and technological achievements cannot reflect social value, that is, overall scientific and technological achievements transformation ability is not enough, a lot of achievement of innovation of science and technology in study, identification and appraisal of came to an end. This phenomenon is a very large number, so that a large number of scientific and technological innovation results.

## **2. Analysis of obstacles in transformation process of mechanical innovation achievements**

### **2.1 Imbalance between theory and practice**

In our country, phenomenon of university is most important theory and practice, which is pursuit of theory value and practical value results. These have not changed much in a long time. Some scientific and technological achievements through scientific research, student competition, innovation and entrepreneurship projects are often focus on or stay in principle research, success of test, principle of production of prototype, and publication of article, as to whether scientific and technological achievements in time and social benefits, generally considered to have little to do with their own. Market economy requires combination of science and technology and economy, which requires scientific research personnel in colleges and universities to solve practical problems and difficulties in production practice. However, some teachers or scientific and technological personnel in colleges and universities are not able to take initiative to face up to market competition, need for enterprise what technology, to solve technical problems of problem is not much knowledge. Whether completion of scientific and technological achievements is an urgent need for enterprises, whether it can transform is not concerned. Which also has objective existence of factors, such as some teachers from school directly to school after graduation, they are educated in the university, but generally lack of practical skills and product manufacturing processes related to specific knowledge, almost no practical experience in relevant enterprises. Therefore, this kind of teacher's knowledge and skills and actual requirements and latest development of professional related enterprises have been out [2]. Another is that some teachers due to the lack of understanding of market, there is no time to pay attention and maintenance of professional and related businesses, not to understand the latest progress of technology, and thus results and practical application of a gap formation, where their professional knowledge level will always stay in current level, gradually from real development of society. This is one of reasons for transformation results.

### **2.2 Lack of specialized results display platform**

Universities generally lack of a special display platform or as intermediary agency, for collection, management, contact teacher to complete research project results, students participate in contest results, students' innovation and entrepreneurship projects. Because of limited social communication between teachers and students, even if some people intend to bring their own research results and social enterprise cooperation to produce social benefits, but can not find channels, or society which is need for university research. There is no such a platform or institution to communicate results of project research, so that some results on stagnation to theoretical research stage. This requires need to do a communication platform or institution, research results and social connections.

## **3. Measures to promote transformation of innovation and entrepreneurship**

### **3.1 Research and Development technology projects in innovation and entrepreneurship base**

At present, many colleges and universities pay more attention to academic standards of teachers. Regardless of school level, evaluation of teacher level, or in evaluation of doctoral, master's, key disciplines, key laboratories, etc., are based on academic level of scientific research, and results of transformation is not or rarely included in evaluation index, which led to rely on teachers' academic achievements, attach importance to theoretical research, to neglect study of development and application, but do not attach importance to transformation of achievements and enterprise [3]. There

are two kinds of sources for design of scientific and technological projects in innovation and entrepreneurship base, one is innovation and technology research of teachers team, and the other is way of training students as main and teacher as second. Teacher is subject, and students are main body, whrer teachers play a guiding role in guiding, teaching. There are enough hardware devices in innovation and entrepreneurship base for use, teachers or students need to make design project of innovation and entrepreneurship to make corresponding physical model. In this process, teachers can make their own theoretical teaching and practical teaching to get a good integration, but also give students a good backing; secondly, students through the project, can take full use of knowledge and practical skills learned in course, but also the ability to work together with students to complete a creative venture. For example, we have been in innovation and entrepreneurship base, by teachers and students together to develop a multi - functional folding chairs and chairs products. Teachers in industrial design of second, third and fourth grades of students in selection, there are 10 students participated in project process, until completion of project. Students go through a large number of accesses to information, program verification, theoretical calculation, drawings, assembly, computer aided virtual modeling design, material selection, and then practice of base material cutting, bending, welding and other processing procedures, completed 1:1's physical model [2]. This model in an exhibition to get a corporate manager's recognition, and with students several times to communicate, business is ready to be put into production. This is a scientific and technological project in innovation and entrepreneurship research and development design, which has been recognized by community.

### **3.2 Focus on enterprise cooperation study**

University is an important base for basic research, and it is also base of scientific and technological achievements. In order to make university's scientific research can better adapt to needs of social and enterprise development, to take scientific research results quickly, so that scientific research activities and external enterprise cooperation, form school enterprise cooperation. In 1970s, National Science Foundation established University of Industry Cooperation Research Center in some universities in China. Purpose is to strengthen research and develop interdisciplinary and high technology fields, 80's and the establishment of Engineering Research Center in university. In Japan, cooperative research is university's scientific research personnel and research staff of private enterprise to use funds provided by enterprise, research subject on basis of joint research, such as Hitachi, Fujitsu and other companies and University of Tokyo cooperation, development of integrated circuits and central calculation device. In Germany, colleges and universities accept scientific research task of enterprises, and enterprises to carry out contract research, for production of enterprises need to serve. In UK, university accepts company's financing, development of scientific research result application and promotes transformation of scientific research achievements to economic circle. Thus, university in guarantee of basic education, we must go out of campus to seek a wide range of social resources, to achieve exchange and sharing of resources, and actual scientific research needs of enterprises to carry out comprehensive cooperation, and constantly promote production, learning, research, combination of scientific and technological research, so that colleges and universities to achieve a higher level of value. Therefore, transformation of scientific and technological achievements should focus on integration of school resources and enterprise resources, and provide a broad platform for transformation results [4]

### **3.3 Schools should set up special result transformation office**

Schools need to set up a special result transformation office, whose purpose is to provide a platform for teachers, students and community to provide an information exchange. On one hand, research results of university teachers and researchers are looking for market. On the other hand, we introduce actual project and management of enterprise to school's teachers, scientific research personnel and students. Members of organization shall be as much as possible to teachers or scientific research personnel, and work to provide different types of services to transformation of scientific and technological achievements. Result transformation office organization should be full range of information, active in technical requirements and technology holders, communication university, research institutions and

enterprises and other types of innovation to participate in main body of technology, and promote interaction of various types of innovative and innovative activities of catalyst, effectively reducing technology transfer process, information, technology, management and financing of barriers and transaction costs, to ensure that system is a weak link or empty to provide compensation for system. Schools set up special result transformation office.

### **3.4 Set up science and technology garden in school**

Establishment of university science and technology park is one of important methods for transformation of scientific and technological achievements of modern universities. Its function is to transform university's high-tech achievements, incubation of high-tech enterprises. Creation of science and technology park in universities is objective requirement of developing high technology and realizing industrialization in new century. It is an important way to promote transformation of scientific and technological achievements and promote reform and development of higher education institutions. Using form of university science and technology park, establishment of school's own innovation and entrepreneurship base, and combination of student development, school principal, is an important work of university in the future. There are more than 3500 colleges and universities in the United States, focusing on transformation of scientific and technological achievements of about 450. World famous Silicon Valley is to establish high-tech park, accelerate scientific and technological achievements transformation leading to world pace [6]. China's Peking University and Tsinghua University, Northeastern University, and other colleges and universities has also founded university science and technology park, and cultivate such as founder, Tsinghua Tongfang, East High School a group of high technology school run enterprises, promote and develop new and high technology industries of our country. Thus, in establishment of scientific and technological park, it should be a great effort to increase investment, and actively work, as soon as possible to build it [7].

### **3.5 Patent application and transfer**

At present, most of teachers or students in colleges and universities participate in design of innovation and entrepreneurship. Results that can be applied to protection of patent applications are not that much and even nothing. Most people think that design project can give me a moment of honor to meet, or in the contest winner or title of award, will not continue to carry out project's technical protection, as students do not know importance of technology protection. This is not a long-term consideration of project, resulting in a considerable number of innovative and entrepreneurial scientific and technological achievements, and even some very creative and market prospects of results in future by others stolen. Innovation and entrepreneurship in universities and colleges is an important part of scientific research results. In order to enable it to realize its social value, innovation and entrepreneurial achievement should be promptly reported to patent, can be technical protection, to prevent ulterior motives of the people use; second, as further research and development of security. Step back, if you do not want to study it, you can transfer patent results, which is a very good initiative. According to data show that in addition to the establishment of scientific and technological parks in the United States to promote transformation of scientific and technological achievements, but also to transfer of scientific and technological achievements in the form of patent transfer to achieve result transformation into market, to obtain benefits [6]. After success of innovation and entrepreneurship, we can make transfer of patent achievements, mainly in following forms: a one-time transfer of the results of the patent, and use of patents to create new enterprises. Innovation and entrepreneurship can be a one-time to enterprise, from enterprise investment funds, equipment, venues and other development and investment market, university is directly profit, no risk; and then interests of colleges and universities can be transferred, which not only stimulate enthusiasm of universities in scientific and technological achievements, and enterprises have achieved a win-win purpose; there is use of patents to create new businesses, creation of innovative business. In terms of innovation and entrepreneurship in colleges and universities, use of patents to create new business for the university of science and technology park in form of a student or a student in their own form of entrepreneurship.

#### 4. Conclusion

Transformation of scientific and technological achievements in mechanical engineering is a complex system engineering, which involves interaction and interaction of scientific research, production, management, social and other aspects. Transformation process includes four stages: production of scientific and technological achievements, management of scientific and technological achievements, transfer of scientific and technological achievements, use of scientific and technological achievements. In this paper, some measures to promote transformation of innovation and entrepreneurship on mechanical specialty are analyzed and studied, and mutual influence and function between various mechanisms are also analyzed and studied, where purpose is to promote innovation and entrepreneurship of machinery.

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