

## British University Research Cooperation Model and Its Successful Experience

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### Abstract

Many scientific studies in the United Kingdom are in the front of the world. They have rich experience and some lessons in the innovation of scientific achievement into wealth. Experience is: the development of policies and measures to promote the cooperation between industry and university, the implementation of specialized research cooperation program; funding to support the transformation of university research results. The main lesson is that the demand for university knowledge is not high. Some universities focus on the establishment of the company, and the university has a high price on intellectual property. Learn from their experiences and lessons to help our country is currently being carried out by the innovation and practice of industry, research cooperation.

**Key words:** United Kingdom; The cooperation of research and industry; Experience; Lesson

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### INTRODUCTION

The UK has a strong scientific basis and weak technology industry, which is typical of the “European Innovation dilemma” (the so-called EU Innovation dilemma is the

EU countries in the top scientific output has played a leading role in the world, but, in the ability to transform this ability to create wealth creation, but lagging behind Yu Quanqiu). In order to change this situation, the British government has taken various measures and achieved fruitful results. While the UK has accumulated a wealth of experience in the field of research and cooperation, but also draw some important lessons.

### 1. THE ORIGIN AND MODE OF THE COMBINATION OF INDUSTRY AND RESEARCH IN THE UK

Britain in the middle of the twelfth century and early thirteenth century, respectively, founded the University of Oxford and University of Cambridge, they are a modern university. Initially these universities do not pay attention to scientific research, but will not participate in technology research and development and industrial cooperation. The education model of the university pays more attention to “gentleman education”, which can be said to be an early British university, and it is the most representative of the British talent training model proposed by Rock, that is, the university is to cultivate the elite with the management and management of the country, and the main content of the teaching is the knowledge of Humanities and social sciences. However, the cooperation in the university has been recognized by the British university, and gradually involved in the. There are scholars research proved that the University of Cambridge in 1881 by Darwin first founded a company named Cambridge Scientific Instruments Inc (CambridgeTnstruments); after the experimental staff Pai (G-Pye-W) named Pai also set up.

The British vocational education system in this period has also been a certain degree of development. The Royal Society of Technology was established in 1852 by the British government, which aims to strengthen the management of the Ministry of science and technology,

which belongs to the vocational technical education, and to some extent, the establishment of this society is also the establishment of a national system of examination system of Vocational and technical disciplines. In the beginning of twentieth century, some of the primary vocational and technical schools and colleges and universities in the private schools, the school model has been promoted and practice, most of these schools are run by private or government organizations. Sunderland technical college which has a representative colleges and universities, the “sandwich” mode of education in the cooperative promotion plays an important role. Some colleges through the improvement of the curriculum system, such as increasing the ratio of applied discipline, practical technology, and actively cooperate with local enterprises, factories, and organize students with relevant professional enterprises to carry out various practical activities.

In the United Kingdom in 1921 established a relatively complete system of technical personnel certificate. The certificate issued by this new system is of uniform standards and the nature of the country, the implementation of the system is achieved through professional associations and the central level education sector collaboration, and finally passed the diploma and certificate granted by the national level. The establishment of this system has the significance of the development of the vocational education in the United Kingdom, which is the examination qualified to enter a certain industry or professional qualification certification. Later, through the modification and improvement, the establishment of the qualification authentication system has played an important role in the development of British industry.

“All west report” is a report of the United Kingdom in the face of some of the important issues in education, this report in 1945 by the members of the association and the education adjustment group members under the joint investigation. The report points out some important problems in the current education system: because there is no cooperation mechanism between industry and technology, industry and education, and the lack of various measures and methods of developing science and technology, which makes the country highly professional and technical education of poor quality, resulting in scientific research into production cycle is too long, which also makes the country face a dilemma. The report pointed out that the problem of education in the United Kingdom also made an important suggestion, that is to strengthen the link between the industry and the education sector, the need to establish regional and national vocational education collaboration and coordination agency. The author believes that the significance of this report is very important, which not only for the post-war British science and technology education policy outlined a blueprint, as the United Kingdom, a wide range of applications of the combination of research, and the government and the determination of civil organizations are not separated.

I believe that the combination of the United Kingdom, the maturity of the model is the beginning of the national Teaching Co in 1975. This also shows that the combination of research and research in the United Kingdom has gradually formed.

First, the company model for the purpose of teaching. In 1975, the United Kingdom began to set up a teaching for the purpose of the company, the company was founded by the British government science and engineering Commission (SERC), the economic and Social Research Council, trade and Industry Bureau, as well as the organization of the United Nations Economic Development Bureau of the northern ireland. Teaching mode, the company closed management, and the Council and the management committee, the board is responsible for the management of daily affairs, the country’s various regions of the teaching project is a number of experience of 20 project coordinator and project management committee to manage. Let the university and enterprises to participate in the project development, to the two a smooth communication channel is the purpose of the company’s teaching for the purpose of the main purpose of the company. Since taking the model to the present, the Teaching Co in the United Kingdom have achieved great success, and greatly improve the competitiveness of the UK products in the international top, mainly reflected in: the number of successful projects through the Teaching Co.443 projects in 1992, the completion of the cooperation projects up to 1000. The number of colleges and universities to participate in more. There are a total of 54,900,000 pounds of colleges and universities involved in the Teaching Co’s cooperation projects. Broad space for cooperation. Areas of cooperation are widely involved in many fields, such as biology, medicine and other fields, information and information technology, textile and plastic rubber, chemical and chemical engineering, etc..

Second, establish and promote the NVQ and GNVO certificate system. The United Kingdom established a unique system of global education, including NVO and GNVO, and the general education certificate, including the certificate system. The British government set up the National Vocational Qualification Committee in 1986, the committee is mainly responsible for the accreditation of qualifications awarded institutions, the development of vocational qualification system policy and the relevant departments to achieve the goal of the system. The committee is composed mainly of by employers, education and training providers, union members and long-term working staff in the certification institutions. The training Business Council is responsible for the implementation of the training plan, to encourage local enterprises to implement the national training plan and NVO standards, and to increase investment in NVQ training. The establishment of the Commission has greatly promoted the further development of the two certification system of the national vocational qualification (GNVO)

and the national vocational qualification (NVQ). NVQ and GNVQ because of the special attention to employers, higher education institutions, professional bodies and individual identification and participation, so get the relevant institutions of acceptance and recognition.

Third, Warrick model and the development of science and technology industrial park. From 1970 to 1979, ten years, university of Oxford, university of Cambridge and other colleges and universities have begun to establish a scientific and Technological Park, these parks focused on the high-tech industry, which marks the British traditional universities focus on the development of science and technology and the role of productivity. The higher education and physical therapy Industry Council published an important article in 1987, "toward cooperation: a government of higher education". The committee is the British government in order to promote the development of industry, research and development in 1986, the report was set up by the positive reaction of the industry and commerce, the main content is the need to vigorously develop the industry university research cooperation. Since the report put forward, the idea of research cooperation in the United Kingdom has been promoted and popularized, which also led to the development of the "Warrick" model, this is the name of University of Warwick, the research cooperation model is the spirit of entrepreneurs. Bart Aus Jack, vice president of University of Warwick, proposed to vigorously develop the academic, strengthen the university and the local industrial community and the link between the efforts to build a research university, university of Warwick, the spirit of the enterprise. University has in 1967 established business school, 1974 Art Center also emerge as the times require, and later in 1980 established the Warwick manufacturing group and established in 1984 at Warwick University Science Park Co., Ltd. is mainly responsible for providing paid services to businesses and communities, the establishment of these institutions strengthened between University and business contact and broaden the scope of services, to from a variety of sources to prepare school funding. Through the business community's long-term cooperation, and on this basis, the continuous summary of the experience of the plant eventually formed a unique "Warrick model".

## 2. THE EXPERIENCE OF THE COMBINATION MODEL OF BRITISH COLLEGE OF PRODUCTION

### 2.1 Develop Special Programs to Promote the Cooperation Between Industry and University

Below are mainly described in the UK for the promotion of research cooperation and the development of specialized programs, including the "contact plan", "Faraday partnership program".

In 1986, the British government implemented the "contact plan", which aims to promote the development of industry and research institutions in the pre-cooperation, the Research Council and the 12 government departments involved. Project applications must be jointly applied by a business and a scientific research unit to be effective, the funding of research and development by enterprises and the government in accordance with the proportion of. "Contact program" is mainly for the three cases of funding: scientific research, product development, product development research, core technology innovation. These three cases can be obtained from the funding of government support, the first two to obtain funding ratio of 50%, the last one is 25%. Finally, the scheme has a good social benefit. In September 2003, the British government commissioned the evaluation team to evaluate the plan effectively. The effect of the implementation of the plan is good, has a good feasibility, and has a wealth of benefits for the economy and science and technology.

The British government also supported the "Ferrari partnership" in 1997, though not the government's organization, but the organization of civil institutions. This program mainly supports the collaboration of several universities research institutions, enterprises and financial institutions, and not just a single university and enterprise. Here's how it works: first, sponsors need to establish different Ferrari alliance in different industries; secondly, within the same industry enterprises and research institutions can apply to join the alliance, after joining the alliance to undertake corresponding obligations, such as paying a certain amount of dues, but also to enjoy corresponding rights, such as free to participate in union organized various meetings, training, exhibition and research activities. Alliance will employ some experts as "technical translator (technology Transl-ator), whose main duty is to find the enterprise demand, will these needs feedback to research institutions, to link the two, Ferrari alliance between enterprises and research institutions plays a intermediary role as a bridge. As of 2003, the United Kingdom has established a 24-Faraday alliances, which mainly covers 27 research institutions, 51 universities, 25 intermediaries, and more than 2,000 enterprises. 24 core research projects and related infrastructure have been highly funded by the British government, the amount of 52,000,000 pounds, at the same time, each alliance will get about 400,000 pounds of UK industry and Commerce Department, the amount will continue for third years, three years after the issue of whether to continue to provide funding assessment.

### 2.2 Building Regional Technology Exchange Network

One of the ways in which the British government promotes the cooperation of industry and research is to help build the regional technology exchange network. London technology network (LTN) is a typical way of the. In 2001, the London technology network was established, the network's main

role is to link the various companies and universities together to help the participants more effective and faster to understand their most needed information, and to London as the center to build a communication network. In such a way, both the enterprise and the university can benefit from the technological innovation in the higher education. The operation mode of LTN is like this: "business training" is a part of the teacher who is active in the first front in colleges and universities. In addition, the LTN is not a regular exchange of technology, the latest research results of the corporate propaganda University, so that the main way of innovation in science and technology can be widely used in Europe is the main way of 31 IRC and LTN IRC.

### 2.3 Technology Transfer in Universities

Interaction and communication between human and human are one of the best ways of knowledge transfer. "Knowledge transfer partnership" is the British government in order to promote the new technology and the establishment of the latest technology. The establishment of the office of the transfer of the University's most popular science and technology to effectively transform, promote the success of the transfer of work.

In 2003, "Teaching Company Scheme" and production partners plan "with the DTI to set up a knowledge transfer partnership (KTP)". Enterprise, university or scientific research unit and KTP are an important part of the plan. First, according to their own situation, the enterprise can find some shortage and the demand of the enterprise. In this case, the enterprise can self perfection, such as the shortage of talented person or the defects of the technology. Through to the KTP institution consulting related research institutions in universities or continuing education institutions of personnel reserves and technical innovation, and the contact, and finally to discuss and cooperate, to discuss the details of development, writing project application and submit the KTIP approval. Generally speaking, the KTP contact is a graduate student in the knowledge base unit, a KTP project can recruit one or more contacts, only in the enterprise work and signed a good agreement with the relevant units. KTP contact the main responsibility is to effectively link the participants, the British government has a certain financial support for the relevant work of the 1-3, the general KTP years, if there is a cost of funding must be their own preparation.

To facilitate the transfer of knowledge, the British government has also set up a special knowledge transfer fund. In England, the United Kingdom established special knowledge transfer funds, including: University Challenge Fund, the higher education innovation fund, the scientific enterprise Challenge Fund, the higher education active social funds, social funds, colleges and enterprises. In terms of higher education, the ad hoc innovation fund was established by the government as a fixed investment (for the Research Council and the Higher Education Investment Commission) to facilitate the transfer of the latest scientific and technological achievements of the University and

the following areas: (a) the latest research results in the business school; (b) to participate in the cooperation and other liaison activities; (c) to establish business; (d) to establish a strategic consultation, and to study the office. (e) providing consultancy and training in all kinds of business.

So far, the UK has generally established a technology transfer office, greatly promoting the University's technology transfer. Which is the most typical ISIS company. The company was founded in university of Oxford, the main business is to provide a variety of consulting services, such as legal advice, patent applications for advice. Through such negotiations to promote the transfer of science and technology. Not only that, ISIS also pay attention to the protection of intellectual property, in the enterprise technology strategy and the school under the guidance of scientific and technological achievements of the assessment, protection of the market work.

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## CONCLUSION

British research cooperation model and its successful experience shows that the construction of national innovation system, promote the economic development of the country or enterprise, to achieve technological innovation, relying on the strength of enterprises, universities, research institutions is not enough, we must rely on the government's policy support and system protection. The government's active intervention is very important for promoting the healthy development of the industry university research cooperation.

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