

Innovation and Practice of Industrial College in University in China

-- Taking Dongguan University of Technology As An Example

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Abstract

Industrial college is of great significance to deepen the reform of higher education in China. Taking Dongguan University of Technology as an example, analyze the industrial college development period and construction situation. Focus on the Chang' an Advanced Manufacturing College and discuss the cooperation among the government, university and enterprise. In the future, different entities should connect more and push forward in all aspects.

Keywords

Industrial college; Dongguan University of Technology; Chang' an Advanced Manufacturing College; Higher Education in China.

1. Introduction

Industrial college is of great significance to deepen the reform of higher education in China. In June 2017, "Beijing Guide", which was an important achievement of China New Engineering Plan, approved by the Ministry of Education and proposed to build co-construction and co-management industrial colleges. In July 2018, the Department of Education in Guangdong issued several opinions on promoting the construction of industrial college in universities, which highly emphasized the importance of the construction of industrial college, and formulated series of measures for future development.

Why did Chinese government and universities attach great importance to the construction of industrial college? In fact, this new type of college was set up to solve such problems: traditional education payed much attention to the logic of fundamental knowledge, and the curriculum design lag behind the development of science and technology. Meanwhile, in many universities, teaching faculty lacked engineering practice experience, and students lacked practical innovation ability. Furthermore, there were barriers between universities and enterprises, and the cooperation between industry and education were push forward without effective carriers. Therefore, industrial college is a new type of organization which is based on the concepts of integration, coordination and sharing. It is guided by regional modern industrial clusters or specific industrial development demands, aiming at training high quality engineering science and technology talents. And it takes industrial technological innovation as traction, builds cooperation management and education system with leading enterprises and other multiple entities, and plays multiple functions of talent training, scientific and technological research, and social service.

2. Development of Industrial College in DGUT

Dongguan is an advanced manufacturing center in Guangdong-Hong Kong-Macao Greater Bay Area, with a relatively complete modern industrial system in line with international standards. Dongguan University of technology (DGUT) was established in 1992 by Guangdong province as well as Dongguan city. And it was the first university in Dongguan. DGUT began to explore the construction of industrial college since 2011. There were three periods in the construction and development of industrial college in DGUT.

The first period was independent exploration (2011-2013). Several general colleges in DGUT broke through traditional modes with their superior disciplines, cooperated with leading enterprises in running colleges actively and established industrial colleges. The second period was standardized management (2014-2015). DGUT summarized the experience of the college exploration, strengthened top-level design and management, incorporated industrial college construction into medium-long term plan and formulated a series of documents such as management measures and assessment methods. The third period was innovative development (2015-). DGUT connected the strategic deployment of regional innovation-driven development in Dongguan deeply, focused on emerging strategic industries, expanded the scope of cooperation subjects greatly, and established more modern industrial colleges.

Now, DGUT have set seven industrial colleges including Huawei Information and Internet Technology College, Siemens Intelligent Manufacturing College, Guangdong-Taiwan Science and Technology College, Guangdong-Hong Kong Robot College, Intelligence Collection Valley and Modern E-Commerce College, Chang' an Advanced Manufacturing College, 360 Cyberspace Security College. DGUT has formed a "3-5-4-3" mode of university-enterprise cooperation cultivation. 3 refers to 3 leading-in of enterprise resources including advanced technique, production equipment, internal engineer training system. 5 refers to 5 joints of industry-education integration including planning professional development jointly, developing project-based courses jointly, setting up teaching and scientific research team jointly, building practical teaching platform jointly, creating technological innovation platform jointly. 4 refers 4 levels of practical teaching including basic experiment and practical teaching system, training improvement and practical teaching system, extracurricular innovation and practical teaching system, engineering application and practical teaching system. 3 refers 3 directions for student development including technical service, technical management, technology research and development.

3. Example of Chang' an Advanced Manufacturing College

Chang' an Advanced Manufacturing College is located in the industrial park of Chang' an Town of Dongguan, covering an area of 11000 square meters. This industrial college focuses on the transformation and upgrading of mold products of computer, communication and consumer electronics in Dongguan and surrounding areas. The Chang' an town is China's top 10 towns, and is a national famous brand building demonstration area of mold industry. There are more than 1100 mechanical and hardware mold enterprises in this town, and the annual output value of mold industry is about 20 billion yuan. Meanwhile, the Chang' an town is also the headquarter of several famous mobile phone manufacturers such as VIVO, OPPO, BUBUGAO.

The main feature of this industrial college is multi-subject participation and collection of advantageous resources. To advance the development of industrial college, government in this town plays the roles of guidance, organization, support, and provides flexible policies for talents and entrepreneurship, as well as offers funds and industrial chain resources. Meanwhile, government supervises the operation and activities of the college.

As for cooperative enterprises, they provide new experimental training equipment, practical posts, and teachers with cutting-edge practical abilities. Enterprises also deeply participate in the construction of practice platforms, majors, courses, and the guidance of innovation and entrepreneurship. The industry associations play a role of bridging and linking. The industry associations find and feedback the industrial development trends and talents demand, participate in the construction of engineering platform, professional curriculum, high-end technical training, and provide help for the internship and employment of students.

The university DGUT is the main subject of the collaborative education, leading high-quality application-oriented talent training. In fact, DGUT provides platforms and team construction of teaching and research, as well as technical supports and services, and the daily management and operation of the industrial college. For this Advanced Manufacturing College, it deepens reform, creates atmosphere, integrates resources, introduces experienced teachers and coordinates with the headquarter of DGUT. These multi-party entities cooperate and integrate global technology resources, enterprise resources, training resources, technology exchange resources, as well as industrial service resources.

The Chang' an Advanced Manufacturing College has implemented the "3+1" Engineering Education Mode, i.e. completing 3 years theoretical teaching and study in the DGUT headquarter, and completing the 1 year last-mile ability improvement in Chang' an Advanced Manufacturing College. The college has organized students to visit and study in famous enterprises and institutions around Chang' an town for about 2000 person times; Students have won more than 100 awards and more than 50 patents in various national and provincial competitions; The college has provided enterprises with more than 20 core scientific and technological research output achievements, more than 100 scientific and technological services, more than 300 times of technical consulting services, and incubated 5 entrepreneurial firms and received venture capital injection.

4. Conclusions

The industrial college has become a new carrier for the integration of regional innovation resources and educational resources; and the key link between talent training chain and local industry chain; and a powerful starting point to comprehensively deepen the reform of higher education. In the future, relevant principals should push forward enterprises, governments, industrial parks and other entities to cooperate and participate in the whole process of talent training, further explore the innovation of collaborative education mode, and improve the quality of cooperation.

Meanwhile, as the main part, universities should improve the internal management mechanism of industrial college, standardize the daily discussion rules, assessment and evaluation mechanisms, fund management rules, teaching management regulations, etc. And ensure the normal operation be in order. In addition, give full play to the role of governing mechanisms such as the council of industrial college and the professional development steering committee of industrial college, stimulate the enthusiasm of teachers to participate in the construction of industrial college and the initiative of students to create, innovate, and start an undertaking by industrial college.

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