

Research on Operation Mode of Application-oriented Undergraduate Intelligent Manufacturing Collaborative Innovation Center

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Abstract: Based on the discussion of the construction strategy of Collaborative Innovation Center, this paper analyzes the institutional setting and responsibilities of Collaborative Innovation Center, focuses on the construction and management of intelligent manufacturing collaborative innovation center, and constructs the operation mode of intelligent manufacturing collaborative innovation center with application-oriented undergraduate characteristics.

1. Introduction

The school enterprise collaborative innovation center has changed the traditional teaching method centered on teachers, classrooms and teaching materials in applied undergraduate colleges, and also changed the closed teaching mode with serious disconnection between theoretical teaching and practical teaching, so as to deeply integrate professional courses with industrial scientific research, production practice and social services, and build a collection of knowledge, skills, practical operation The new teaching and scientific research mode of serving the society promotes the integration, opening and sharing of resources, and can create greater economic and social value[1][2].

Taking the collaborative innovation center as the carrier for talent training can realize the close combination of theoretical teaching and practical training, teaching and scientific research, production and management practice, the close combination of school teachers and social tutors, the close combination of educational training behavior and social training behavior, and the combination of educational concept and talent training mode innovation[3][4].

2. Construction strategy of Collaborative Innovation Center

(1) Establish the operation mechanism of collaborative innovation center

Build an industry university research collaborative innovation platform and build a technological innovation community with the government, enterprises and scientific research institutions. According to the practical experience in the construction of school enterprise collaborative innovation center, relying on the overall design of the construction mechanism and system of industry university research collaborative innovation platform, reform the operation mechanism of

collaborative innovation center. The first is to establish a mechanism of industry university research collaborative innovation platform for flexible use of talents, establish an expert database in the platform, solve the difficult situation of talent flow through flexible use of talents, and ensure the implementation and completion of the project[5][6]. The second is to establish the resource sharing mechanism of the platform. All units share excellent resources into the platform resource pool to share resources and learn from each other's strengths to make up for their weaknesses[7]. The third is to establish the service mechanism of industry university research collaborative innovation platform, establish the mechanism of serving scientific and technological innovation, formulate the plan of collaborative innovation projects, and jointly develop scientific research achievements that meet the development of social needs, so as to solve the difficult problems and key technologies in production and life[8].

(2) strengthen the construction of innovative teacher team

Relying on the innovative service platform of Industry University Research Association, first, promote the construction of professional leaders and backbone teachers, give play to its leading role in professional construction and teaching reform, cultivate a group of backbone teachers, update teaching contents, innovate teaching ideas, improve teaching level, and improve the overall quality of teachers. Second, promote the construction of teaching team, focus on key professional clusters, rely on key projects, and take team leaders as the core to vigorously cultivate teaching team. Through the construction, the teaching team will be trained into a team of teachers with excellent political thought, high professional level and outstanding scientific research achievements. At the same time, give full play to the exemplary and leading role of the teaching team in the construction of teachers, improve the overall quality and level of teachers, promote education and teaching reform and improve education and teaching quality. Third, promote the construction of scientific research teams, give play to the role of scientific research platform for school enterprise cooperation through the deep integration of schools and enterprises, build a number of scientific research teams with strong independent innovation ability, serve regional economic and social development, and solve practical problems in production management of industrial enterprises, so as to improve social service ability.

(3) enhance social service capacity

Relying on the platform, the Collaborative Innovation Center deeply explores the talent selection mechanism, and attracts elite talents and technical backbone personnel from industrial enterprises and related fields to participate in cooperation. Carry out technical consulting service training for the society, provide technical support and help, deeply integrate schools and enterprises, carry out applied technology research and development, and solve major practical problems. Establish the transformation and Incubation Mechanism of scientific research achievements, timely transform scientific research achievements, apply them to enterprise practice, cooperate with enterprises to incubate achievements, open up a green channel for the transformation of scientific research achievements into incubation, and make the achievements industrialized.

3. Responsibilities of the center

The executive agency of the center is responsible for the daily operation of the center and is responsible for implementing the decisions of the management committee. The center often sets up a comprehensive management office, human resources department, innovation research department and industrialization promotion department to be responsible for the coordination and guarantee of the project. The specific responsibilities of the center mainly include the following aspects.

Be responsible for daily administrative affairs and provide necessary service support for the center; Assist in formulating the center's planning, articles of association and systems, and establish

and improve the rules and regulations for the distribution of rights and responsibilities among collaborative units. Arrange the regular work meeting of the center; Assist in organizing various important conferences and academic activities of the center.

Be responsible for the collection and sorting of various academic trends and scientific research information, and provide services for scientific research teams to query the latest research results at home and abroad. Establish a regular release mechanism for scientific research information of the center, timely grasp and update the latest highlights related to the center, relevant policies at home and abroad and other information trends, guide the scientific and technological development of the center and various cooperation with enterprises.

Assist the scientific research team of the center to complete the procurement of various materials, such as instruments and equipment, office supplies and experimental consumables, including the investigation, demonstration and price negotiation of large instruments and equipment.

Be responsible for the photography, recording and summary of the center's visit or visit, academic exchange, enterprise cooperation and other matters, as well as the later material sorting.

4. Construction and management of intelligent manufacturing collaborative innovation center

The intelligent manufacturing collaborative innovation center advocates the development concept of "talent oriented, academic supremacy, openness and win-win, collaborative innovation" in accordance with the principle of "demand-oriented, comprehensive opening, in-depth integration and innovation leading". The director responsibility system under the guidance of the central leading group and the operation mechanism of "openness, mobility, alliance and competition" are implemented, with sound systems and standardized management. The construction of intelligent manufacturing collaborative innovation center is divided into six areas according to its core functions, and the training equipment and training teaching projects are developed respectively.

(1) Intelligent factory area

The functional orientation of this area is: basic cognitive practice of intelligent manufacturing, research on knowledge system of intelligent factory, commissioning of relevant equipment of intelligent factory and research and development of teaching module of intelligent factory, which can meet the requirements of comprehensive training service of intelligent manufacturing and personalized innovative manufacturing. The supported projects mainly include high-speed machining technology, machine tool machining technology, robot application technology, automatic production line control and management, intelligent technology application, etc.

(2) Industrial robot area

The functional orientation of this area is: professional teacher training of industrial robot, basic public training service of industrial robot, enterprise skill training service of industrial robot, vocational skill appraisal and cognitive practice of other innovative robots. Supported projects mainly include typical applications such as mechanical disassembly and assembly of industrial robots, electrical disassembly and assembly of industrial robots, handling of industrial robots, stacking of industrial robots, etc.

(3) Automatic control area

The functional orientation of this area is: basic cognitive practice service of intelligent manufacturing, research of automation knowledge system, research of automation related equipment and research of automation teaching module, support comprehensive training service of intelligent manufacturing and automatic personalized manufacturing, and mainly cultivate high-quality application-oriented talents such as debugging, integration and maintenance of

automatic production line. The supported projects mainly include production line simulation, production line layout, electrical design and unit management and control system.

(4) Precision measurement area

The functional orientation of this area is: precision measurement professional teacher training, precision measurement professional basic public training service, precision measurement enterprise skill training service, and other innovative precision measurement cognitive practice. The supported projects mainly include the use and research of detection and control technology and intelligent detection instruments, the discussion of new principles and methods of automatic detection and control technology, the research of dynamic detection and control such as new sensor technology and computer technology, and the application of on-line testing in the automation of production process.

(5) Advanced manufacturing area

The functional orientation of this area is: basic cognitive practice of intelligent manufacturing, research of advanced manufacturing knowledge system, research of advanced manufacturing related equipment and research of advanced manufacturing teaching module. At the same time, it also supports comprehensive training service of intelligent manufacturing and personalized manufacturing of advanced manufacturing. The advanced manufacturing zone mainly supports high-speed, high-precision, multi axis processing technology, etc.

(6) Digital design and manufacturing area

The functional orientation of this area is: intelligent factory management and control, digital design, manufacturing and production management, CAD, CAM , CAPP, and other software applications and engineering implementation. Supported projects include: intelligent factory software application, application of knowledge and information sharing technology for intelligent manufacturing system product development, development of product design knowledge base, process knowledge base and process basic database. The above technologies not only provide support for product and system design, manufacturing and management, but also realize the information integration and exchange between CAX, PDM system and MES system in the training center, and support knowledge reuse and information sharing in the process of product development.

5. Conclusion

This paper analyzes the operation mode of application-oriented undergraduate intelligent manufacturing collaborative innovation center, which has the application value and promotion value of scientific, effective, demonstration and guidance. The construction of intelligent manufacturing collaborative innovation center strengthens the cooperation among colleges and universities, scientific research institutions and enterprises. On the one hand, it can continuously improve the operation ability, innovation ability and talent training ability of the collaborative innovation center of colleges and universities, on the other hand, it can effectively promote the development of local regional economy and science and technology.

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