Research on the Construction of Intelligent Engineering Training Center-Taking Jilin University as an Example

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Abstract: In order to stand on the forefront of the new era and conform to the needs of China's modernization and intelligent industrial development, on the basis of the practical teaching functions of the original engineering training center, the organizational structure and management system of the engineering training center were re-planned and intelligent engineering was constructed. The training center has elaborated on its construction content and application, including the intelligent engineering training center construction system, intelligent management platform, intelligent educational administration platform, intelligent application platform and intelligent innovation and entrepreneurship platform. The construction and application of the intelligent engineering training center of Jilin University will greatly improve the efficiency of engineering training practice teaching management.

1. Introduction

The development of information technology in the 21st century is very rapid. The introduction and development of concepts such as "Industry 4.0", "Intelligent Manufacturing" and "Industrial Internet of Things" have forced the transformation and upgrading of traditional industrial models, leading the rapid progress of society with new technological innovation concepts. Among them, "intelligent manufacturing" is the core of the five core projects of the "Made in China 2025" strategy for manufacturing the strong country. Intelligent manufacturing plays a very important role and far-reaching significance not only for China to promote innovation-driven strategy, building a resource-saving and environment-friendly society, and building a manufacturing power with high industry and enterprise competitiveness. At the same time, it is also the main development direction for promoting the in-depth integration of informatization and industrialization in the current and future period.

Jilin University is at the forefront of the new era. Based on digital technology and intelligent technology, with the support of the Internet, big data, Internet of Things, and cloud computing, we will create a new intelligent engineering training center with intelligent manufacturing, intelligent control, intelligent management and intelligent services to build a new industrial revolution background. Under the engineering training system of mechanical, materials, automotive, biology, management, art and humanities, improve students' innovative ability and engineering practice ability, and cultivate innovative talents with high engineering quality and international vision [1].

2. Intelligent Engineering Training Center Construction System

Based on digital technology and intelligent technology, Jilin University Intelligent Engineering Training Center integrates intelligent design, intelligent manufacturing, intelligent control, intelligent management and intelligent services with the support of Internet, big data, Internet of Things and cloud computing. The new era intelligent engineering training platform, and on this basis, build an intelligent and innovative service platform for innovation and entrepreneurship education, provide an important impetus for college students' innovation and entrepreneurship, form an important influence

and demonstration effect, and build a domestic leading and international first-class. Jilin University Intelligent Engineering Training Center.

3. Intelligent Engineering Training Center Construction Content

3.1 Intelligent management platform

3.1.1 Dynamic monitoring system

The dynamic monitoring platform is an important construction content of Jilin University to build an intelligent engineering training center. The goal of the dynamic monitoring platform is to ensure the safety of the entire training center through the Internet of Things, including the safety monitoring of water, electricity, fire teaching facilities and public activities.

The dynamic monitoring platform for the center water safety is to set up flow monitoring devices for all water pipelines and water outlet terminals through the Internet of Things system, and establish a safe water dynamic monitoring system, including real-time monitoring of water consumption and water leakage conditions. The dynamic monitoring platform for the central electricity safety is to establish a safe power monitoring system by installing a current quantity monitoring device for the nodes in the classroom and independent mechanical equipment. The dynamic monitoring platform monitors the central fire safety through the Internet of Things, establishes a fire dynamic monitoring system, and monitors the fire prevention status of each area in the real-time. The dynamic monitoring platform monitors the Internet of Things in public areas and teaching venues, and establishes a real-time dynamic video monitoring system to ensure the security of the center [3].

3.1.2 Equipment management system

The equipment management platform of Jilin University Intelligent Engineering Training Center refers to the intelligent management of process, usage record, maintenance record and custody record of all instruments and equipment in the whole life cycle of the center, and establishes a device management platform based on Internet and mobile APP. To realize the networked control of the equipment, automatically record the power-off status of the equipment, use information and maintenance information, so that the central equipment management person in charge and the school equipment management office can monitor all aspects of the equipment at any time. It not only improves the safety factor of equipment use, but also improves the management level and management efficiency of the equipment. The intelligent construction of the center has greatly improved the management level and management efficiency of the existing instruments and equipment, and truly realized digitalization and informationization [4].

3.1.3 Tool, material storage management system

The Engineering Training Center of Jilin University carries the teaching and practice teaching of undergraduate engineering training for all school and near-class undergraduates [5]. Various tools involved in the teaching process of each practical teaching module, including measuring tools, fixtures, tools, etc. For example, various types of metal sheets, bars, plexiglass sheets, plastic pellets, ingots, electronic components, etc., can be managed through the warehouse management platform under the Internet of Things system, including information of responsible persons. Information on the cost, requirements, inventory status, inventory status, and usage history of various tools and materials. The central intelligent warehouse management platform realizes digitization and informationization, which makes the information update timely, thus greatly improving the management efficiency [1].

3.2 Intelligent educational platform

3.2.1 Network teaching service system

The intelligent network teaching service system contains rich teaching resources. The teaching resources are based on the engineering training syllabus of Jilin University, including information on

the working principle, process specifications, operation methods, materials and tools selection and use methods of each practical teaching module. Due to the different characteristics of each knowledge point, the specific expressions of teaching resources are also different. On the basis of intelligent information technology, the specific forms of expression include: self-learning knowledge points to explain words, pictures, teaching recordings, teaching videos, animations and micro-course videos, etc. It can maximize the advantages of intelligent information technology, enhance students' interest in learning, and accelerate the understanding and absorption of knowledge [6].

3.2.2 Educational information management system

The educational information management system is essential in the central intelligent educational platform. The functions realized by the educational information management system are: teaching management system, course management system, examination system and achievement management system. The teaching management system is divided into three aspects: teaching plan management, teaching process management and teaching quality management. Teaching plan management includes rational allocation of teaching resources, organization of teaching activities, and development and publication of teaching plans on the Internet platform. Teaching process management includes guidance and monitoring of the central teaching venue to ensure the real-time management of teaching and learning processes. Teaching quality management includes online collection of teaching data and summary of teaching results. The course management system is mainly composed of a teacher scheduling system and a student selection system.

The course management system is mainly composed of a teacher scheduling system and a student selection system. The teacher scheduling system is based on the intelligent arrangement of the courses that the corresponding students of the corresponding grades of the platform database should complete. According to the actual situation, the corresponding teacher is arranged to teach, and the class schedule is automatically generated for teachers and students to download. The examination system is based on the safety education and practical skills of engineering training, and provides an online examination platform for students through the Internet. The platform integrates various intelligent teaching resources and exam question banks prepared by excellent teachers of the center, and evaluates and evaluates students' learning situation and operation in specific scenarios and specific processes from time to time, thus improving students' learning quality.

The main function of the score management system is that the trainers and teachers of the job can enter, view, modify, delete, etc. the students' grades according to the authority. The establishment of the educational information system fully guarantees the smooth progress of the whole process of teaching and the quality of teaching.

3.2.3 Student Growth Management System

The Student Growth Management System has the function of managing the student's student status and tracking and evaluating the growth process. Through the educational information management platform to introduce students' student status and basic information, the system automatically records the students' online and offline learning process, daily performance, test scores, and results works, to achieve data connection with the educational information system, and establish a scientific evaluation system. Conduct a scientific and reasonable analysis of the student's growth process and give advice.

3.3 Intelligent application platform

3.3.1 Center website construction

As an important way of information interaction, the portal of Jilin University Intelligent Engineering Training Center is a window for information release and sharing. After continuous construction, the center website has covered the center summary, teaching and research, teacher team, party building work, comprehensive management and innovation. Modules such as talent training allow the public to keep abreast of the current status of the engineering training center so that students can pay attention to the dynamics of engineering training in a timely manner.

3.3.2 Quality Course Construction

The construction of the Center's quality courses is mainly to build a national-level engineering training system quality course, and to aim at network teaching based on the Internet platform. The quality course includes three-dimensional teaching resources such as course information, electronic lesson plans, preview notes, and various courseware for platform users to choose independently; and set up an online Q&A platform. After the course, the network test can be conducted, and finally the intelligent network teaching is realized [7].

3.4 Intelligent Innovation and Entrepreneurship Platform

"Mass entrepreneurship and innovation" is the label of this era, and innovation and entrepreneurship education has become a key research topic in universities [8-9]. Therefore, the engineering training center of Jilin University establishes an intelligent innovation and entrepreneurship platform to help college students improve their innovation and entrepreneurship ability, which is a new engineering training concept and a feasible attempt [10-11].

3.4.1 Management Service Center

The management service center is the foundation of the intelligent innovation and entrepreneurship platform. It is mainly composed of two parts. The first is the management platform under the responsibility of the department leaders. The management platform is mainly responsible for the operation of the entire platform, including project declaration, project implementation, equipment management, data storage, and basic information and works of teachers and students. The second is a service platform that is supported by departmental teachers and students. The service platform is designed to provide smarter, more convenient and comprehensive services for students participating in innovation and entrepreneurship, including the release of real-time information, registration of related courses, equipment and materials, appointment use, equipment purchase and maintenance, and professional technical training have effectively solved a series of problems arising on the innovation and entrepreneurship platform [12].

3.4.2 Innovative entrepreneurial community

Innovative entrepreneurial community is the source of strength for the construction of intelligent innovation and entrepreneurship platform, mainly including online website forums and offline maker space. The website forum is open to teachers and students throughout the school. Teachers can post notices and topic information on the website forum. Students can post on the forum to discuss issues related to innovation and entrepreneurship, and publish topics to find interested students to form a team. Many resources can also be shared on the forum, such as the results and experience of other makers. It is convenient for the management of teachers and the exchange of teachers and students, as well as the development of intelligent innovation and entrepreneurship platforms. Maker Space is a space for students who are interested in innovation and entrepreneurship to study office, communicate, run projects, organize events and display works [14-15].

4. Conclusion

This paper elaborates on the specific content of the intelligent engineering training center of Jilin University. The intelligent management platform effectively protects the practice teaching of the center and improves the efficiency of the overall operation of the center. The intelligent educational platform effectively improves the engineering practice. The quality and efficiency of training enriches the teaching content; the intelligent application platform is the bridge between the center and the outside world, the service window for the public, and an important way to realize the intelligent engineering training center; the intelligent innovation and entrepreneurship platform can

cultivate college students' innovation Entrepreneurial ability also promotes the development of innovative engineering training centers.

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