

The research of building chemical engineering simulation experimental teaching center platform in universities

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Abstract

This paper expounds the importance of building chemical engineering simulation experimental teaching center platform. Discusses the target, idea and train of thought of building chemical engineering simulation experimental teaching center platform, put forward the construction measures for the chemical engineering simulation experimental teaching center platform and the main functions and characteristics of the details.

Keywords

Chemical engineering simulation, Experimental teaching center, Platform construction.

1. Introduction

The simulation of experimental teaching is the higher education informatization construction and the important content of experimental teaching demonstration center construction, is the product of professional disciplines and depth of information technology integration. For the implementation of the 'several opinions on comprehensively improve the quality of higher education' by ministry of education spirit[1], according to 'education informatization 10 years of development planning', the ministry of education decided to start in 2013 to carry out the virtual simulation experiment teaching center of national construction work. One of the virtual simulation experiment teaching management and sharing platform is one of the important content of the construction of the center [2, 3].

Chemical engineering industry is the pillar industry of national economy, the huge equipment and the high concentration of complexes in complex as the foundation, presents the growing scale of production, investment, consumption growing, the trend of automation increasing, continuous production process is not reversible, high temperature and high pressure, inflammable and explosive, poisonous and harmful high risk. Although almost all of the engineering school has set up a stable practice base, but as a result of large-scale enterprise process complex chemical process, a high degree of automation, equipment advanced mechanical equipments, high site operation requirements for workers. Enterprise for security considerations, production workshop practice more restrictions on students of time and space scope, the students are not allowed to move, no touch, causing students practice low participation, practice effect is poor [4].

2. Platform construction goal

Chemical production process simulation as the core of platform construction, Built a chemical engineering and technical personnel practical ability education platform; On this basis, establish a set of perfect, the openness of the advanced operation management system and network operation management platform, to achieve a wider range of chemical factory network sharing online 3D simulation, in the service of both chemical professional practice and enterprise staff training colleges and universities [5].

3. Platform construction idea [6]

Platform construction with advanced concept, advanced hardware equipment, advanced software technology, advanced teaching methods, advanced management mode, advanced examination

method. Modern information technology and chemical discipline specialty technology integration, multi-specialty by the same software integration. Sharing resource, sharing network face-to-face, sharing between colleges. In university-enterprise cooperation for the development of this platform and used as an opportunity to engineer by the enterprise to engineering quality education of university teachers, the college teachers to re-education of the theoretical foundation of the enterprise engineers, development centers on both sides between colleges of education and service function.

4. Measures of the platform construction

4.1 Construction of management system

Further give full play to the colleges and universities, business expertise, resources advantage, platform, complementary advantages, talent advantage, innovation mechanism of university-enterprise cooperation, and cooperation with enterprises to establish a set of software development, teaching training, and social services in the integration of enterprise operation mechanism.

4.2 Construction of teachers team

Further introduced with chemical background, software development and technical personnel, the network platform developers, system developers, the introduction of enterprise operation and management talent, formed for the development of colleges and universities and enterprises tailored training software team, engineering training face-to-face training team, teaching design and teaching materials construction of the research team, and efficient management team.

4.3 Platform extensions

In chemical production process chain for clues, a relatively complete 3D simulation of chemical process of teaching resources was constructed.

4.4 Sharing 3D simulation software of network resources

For the realization of the sharing of teaching resources inside to let the students can not be restricted by time, space, regional, completely independently to carry out the engineering training, and access to grades and credits, is very important to further improve the function of remote login.

4.5 Promote the reform and practice of the integration teaching mode

In platform construction as an opportunity to make full use of the center of 3D simulation of teaching resources to provide realistic factory scene and details, reforming teaching material construction, teaching methods, such as advancing the 'class -simulation-factory' integration of teaching model reform and practice.

5. Main functions of the platform

5.1 Application in the theory teaching

Simulation software function extension of teaching resources, can affect and promote university engineering courses teaching method and mode of change. To encourage teachers to applicat the simulation software of education thoughts, provided by the project cases, vividly the work resources provided by to the teaching course. The theory of abstract concepts, complicated problems in the course in the form of intuitive is showed to students, help students to understand the project, see the factory practice, advancing the 'class-simulation-factory' with 'integration' teaching model reform and practice of university unique new engineering applied talents training mode[7].

5.2 Application of simulation teaching resources in the experimental teaching

Open and sharing platform including simulation experiment teaching management center portal, virtual experiment in front of the theoretical study and experiment course management, maintenance of typical experimental library, experiment teaching, experiment process of intelligent guidance, automatic correcting, experimental results of the test results of statistical query, digital resource management, the interaction between teachers and students, the system management subsystem [5].

5.3 Application of simulation teaching resources in practice

Internship center will use 'commercial production' as the main line, a complete process of 'VR' model simulation comprehensive industrial equipment is used, into the practice of relevant professional students should have the 'post' professional regulations, training center run completely simulate normal unit operation order and condition, the practice behavior must be fully comply with the regular employees safety operation specification[8].

5.4 Application of simulation teaching resources in graduation segment

Due to the data of process simulation resources are basically comes from the factory actual operation data, thus provides the graduation link abundant teaching resources.

5.5 Application of simulation teaching resources in the students' innovative activities

Students can through process simulation software to carry on the material balance, energy balance, process optimization, and validate the simulation process. With 3D simulation software for workshop equipment, pipelines, factory layout for 3D modeling.

6. Characteristic of simulation experiment teaching center

- (1) Whole production process, industrial scale and production process simulation scenarios, the actual hands-on in field is one of the features of chemical simulation training center.
- (2) Practical running system uses 'real factory management' is the second characteristic of the virtual simulation training center.
- (3) 'Fully functional, seriation, expandable' is the third characteristic of chemical virtual simulation training center.

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