



Construction of Intelligent Laboratory of Desktop Cloud Platform Based on Digital Reform Exploration of Network and New Media Major

Wei Guo^(✉)

School of Literature and Law, Wuhan Donghu University, Wuhan, China
irisguo@126.com

Abstract. This paper takes the construction of digital courses for network and new media major as the foundation, takes laboratory construction, education and teaching reform, education concept and mode, multi-coupling mechanism and collaborative innovation of talent training quality as the main body, and discusses the main technical solutions of intelligent virtual simulation system, intelligent multifunctional check-in system, intelligent virtual cloud desktop laboratory sharing platform, etc. It provides reference for the construction and application of intelligent laboratory in universities.

Keywords: Intelligent Laboratory · Cloud desktop lab sharing platform · Digital reform exploration

1 Introduction

Experimental teaching, as an important link in the exploration of digital reform of network and new media major, has become an important task in the construction of experimental teaching in colleges and universities through the deep integration of information technology and experimental teaching, the sharing of teaching resources and teaching results, and the improvement of teaching quality and teaching level.

Cloud platform can realize the management of experimental teaching, and realize the true integration and sharing of basic experiments, interdisciplinary comprehensive experiments, innovation and entrepreneurship experiments and scientific research experiments. Fast, flexible and flexible allocation of experimental resources, saving investment, improving resource utilization, enhancing operational reliability of experimental equipment, reducing energy consumption, supporting mobile experimental terminals, and finally realizing the true opening of the laboratory beyond the limitations of time and space.

2 Requirements for the Construction of Intelligent Laboratory

2.1 Explore the Technical Connotation of the New Liberal Arts Wisdom Laboratory that Meets the Requirements of the Digital Reform of Network and New Media

Based on the technology realization of link prediction and completion technology, entity and link search and matching rule optimization and other technologies in the construction of smart lab, smart education is organically integrated into the collaborative evolution and mode optimization process of autonomous and innovative talent cultivation, so as to form the integration and innovation of education intelligence and education and teaching methods. To achieve a virtuous circle of laboratory, discipline, specialty, curriculum collaborative construction [1].

2.2 From the Perspective of Education and Teaching, the Compatibility Between the Construction of Smart Laboratory and the Teaching of Network and New Media Major is Analyzed

Based on the concept of multiple demand modules, based on the vertical, horizontal and star modes, through different perspectives such as coupling and collaboration, a multi-level and multi-module functional system of the smart laboratory is constructed, the basic hardware facilities are optimized, the construction process and application scenarios of the smart laboratory in smart teaching, scientific research and laboratory management are set up, and the system architecture is constantly improved.

2.3 Rely on Artificial Intelligence, Big Data, Cloud Computing and Other Emerging Technologies to Build the Training of News and Communication Talents

Intelligent management of hardware and software equipment, physical equipment, information equipment, management system and operation process of the laboratory can be realized with the help of emerging technologies, so as to provide a good laboratory teaching and scientific research atmosphere, provide intelligent laboratory services for students and managers, build an efficient and intelligent comprehensive information platform, support the dynamic evolution of students' knowledge system and support managers' efficient process management. The intelligent environment is organically integrated into the collaborative evolution and model optimization process of autonomous and innovative talent training.

3 Characteristics of Intelligent Laboratory

3.1 Standardization

In strict accordance with the national smart laboratory standards for design and construction, the implementation of the results to meet the requirements of the relevant specifications, to ensure that the data centralization, information sharing, content customization, hardware clustering, electronic documents, process standardization, the final

realization of winter information, statistics, analysis, for the majority of teachers and students service, for the school leadership scientific decision-making to provide a real and reliable basis.

3.2 Make Full Use of Original Resources

Make full use of the original available facilities, avoid repeated purchase, complete the aggregation and sharing of multi-model, multi-type and multi-regional servers, save investment and reduce operating costs, break barriers, improve the management methods and forms of data centers, and strongly support education, teaching and scientific research.

3.3 Intelligent Multi-integration Management

The comprehensive dynamic environment system of Wisdom Laboratory is fully integrated with the central control system. Through mobile phones, tablets and touch screen devices, various equipment such as lighting, fresh air, projection, curtains and access control are centrally controlled in the room. In addition, various scene modes are set and can be activated by key operation, which greatly facilitates the comprehensive on-site management of the room.

3.4 Multi-function Automatic Management

A variety of display devices, such as large-screen TV, vertical display terminal, touch screen terminal, splicing-large screen equipment and electronically controlled dimming transmission projection system, are arranged in the smart lab. They are all managed and driven by thin client mode. Administrators do not need to carry out on-site configuration and maintenance of the devices, but only need to manage them in the background to achieve comprehensive management of all display contents.

4 Main Technical Scheme of Smart Laboratory

Based on cutting-edge technologies and technologies such as the Internet of Things, cloud computing, 5G communication, big data, artificial intelligence and BIM 3D information model, it takes advantage of the ubiquitous interconnection characteristics of the laboratory site, human, machine, network, things and other associated systems to form a platform for interconnection and collaboration, information sharing, security monitoring and intelligent operation and maintenance and decision-making. [2] Build an information platform system and intelligent laboratory with complete functions, advanced systems, security and stability, and strong expansibility. We should actively reform and innovate the experimental teaching model, build professional, diversified and distinctive network and new media teaching platforms, and establish the reform model of practical teaching system of journalism and communication in universities under the intelligent experimental environment (see Fig. 1).

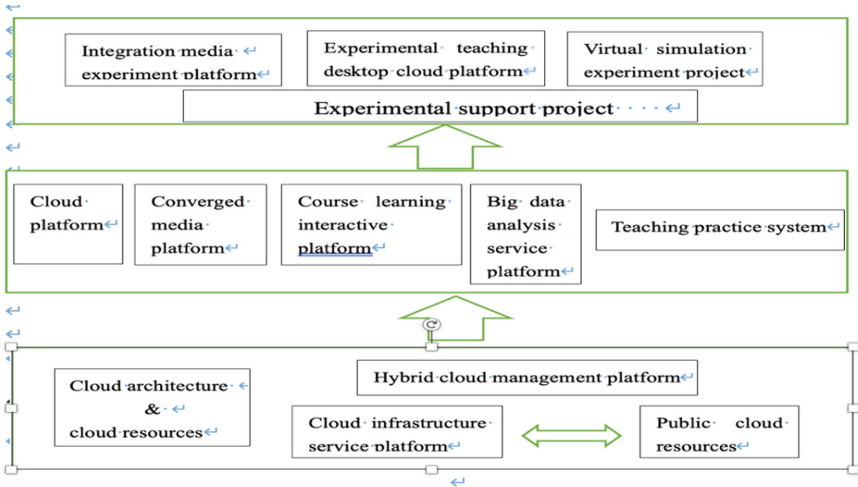


Fig. 1. Digital reform mode of network and new media major

4.1 Intelligent Virtual Simulation System

Through VR technology, VR interactive technology, VR equipment and VR course resources, virtual rehearsal environment is provided in class through virtual studio system, and difficult professional knowledge points are visually displayed through VR [3]. Advanced teaching AIDS are added, virtual interactive system and related resources are configured, so that students can have intuitive experience of structured knowledge. With the virtual development of teaching areas, the integration of teaching and research is realized, and the teaching efficiency and teaching quality are improved. It provides a complete collection function of teaching resources, including normal recording and broadcasting, first-class course recording and broadcasting, and higher specification 3D virtual playback, to meet the needs of different types of course recording; Through the addition of interactive teaching software, the remote interaction function is introduced to strengthen students' self-learning and mutual learning, and break the space boundary of the classroom.

4.2 Intelligent Multifunctional Check-In System

The conference management system manages all kinds of meetings in the lecture hall by planning, releasing and signing in. It gathers all kinds of data from the conference attendance system and one card to form a set of data matching the sign-in information with the conference information, and then imports it into the credit management system of the personnel system to automatically complete the record of credits. Some front-end devices and handheld devices of access control are also connected to the back-end platform through WiFi environment. The conference attendance system is divided into the front end and the management platform. The front end is used to receive the user's card swiping behavior, judge whether the user has the right to attend the meeting according to the information of the conference management system, judge whether the user arrives and

leaves on time according to the card swiping time information, and provide attendance records. The attendance system is integrated with the campus all-card system in the background. The personal information, organizational structure, logical number and other information of users in the all-card system are directly called by the bottom of the attendance management platform to realize real-time synchronization with the main database [4]. At the same time, a wireless environment is deployed in each lecture hall to provide various Internet access services to participants.

4.3 Intelligent Virtual Cloud Desktop Lab Sharing Platform

The cloud technology platform integrates system hardware, software, and data storage resources into a unified resource pool without requiring users to know about servers. The user uses the thin client for data input and hands the required individual operations to the server cluster for processing [5].

The intelligent laboratory cloud platform uses VDI solutions to provide network client applications for host users and deliver virtual machine desktops to remote thin clients. In the face of laboratory software complexity, data storage difficulty and other problems, cloud desktop technology sharing platform functions include resource cluster management, to meet the requirements of constantly updating the software and hardware of resources. In the development of the laboratory, a variety of professional software sharing such as development and calculation is purchased to improve the utilization of resources. The laboratory platform centrally manages software and dynamically uses limited resources. Software resources are installed on the server and no application program is required. Massive experimental data can be stored safely in time, and the cloud platform has backup and induction functions for data recovery. With the enhancement of virtual software function, a large number of software simulation puts forward higher requirements for computer hardware, and application publishing technology can meet the requirements of client resource updating hardware [4].

The desktop cloud platform consists of four modules: cloud terminal, terminal access network, desktop cloud interactive control, and desktop cloud data center (Fig. 2).

The intelligent laboratory cloud platform technology uses virtualization technology to add the abstraction layer, and adjusts the system scale according to the change of demand. The platform architecture adopts multi-server group deployment mode, and the platform support server includes virtual application server cluster. Users use terminals to connect to the inbound server and access the background system through virtual desktops to benefit from resources. Server clusters are deployed in a unified manner to balance resources [6]. In the laboratory, shareable software can be centrally deployed on virtual application servers, and desktop and application programs can be released according to different software running environments. Using information technology to promote virtual laboratory to use limited resources, cloud technology to realize comprehensive sharing of resources, unified management of resources using cloud technology, compared with traditional network services has obvious advantages.

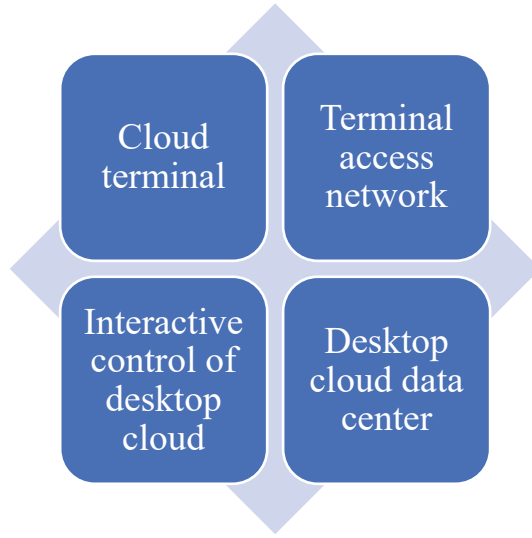


Fig. 2. Workflow of the desktop cloud platform

5 Conclusion

This paper starts from the construction of efficient intelligent laboratory management, compares the construction status of traditional laboratories, and combines with the digital reform needs of network and new media majors to analyze the traditional teaching platform, and finds that there are problems such as software and hardware management difficulties, low resource utilization rate, and high computer power consumption. Based on cloud platform information management technology to realize resource virtual sharing, cloud technology has brought changes to the utilization of resources in colleges and universities, elastic services improve the efficiency of infrastructure, reduce the pressure of software and hardware maintenance personnel, and promote the sharing of high-quality education resources. Open resource pool to social counterparts, cloud technology provides convenient channel for the construction of virtual laboratory, should develop the platform in data processing application, better play a role in teaching and research.

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