Research on Information Construction of Training Rooms in Higher Vocational Colleges Based on Big Data

一Taking Guangdong Jidian Polytechnic as an Example

Yifan Chen
Guangdong Jidian Polytechnic
Guangzhou, Guangdong 510515

Abstract—**In terms of the problems on poor quality and low efficiency of training room management, a practical scheme of information construction of training rooms based on big data has been proposed in this paper, which mainly includes construction of the training room information platform and sharing of the data from the information management platform through big data technology. Based on big data, the information construction takes training rooms as the main line and then connects all management resources so as to achieve all-round management of training rooms, and improve the quality and efficiency of training room management. The training room management should start from the perspective of serving teachers and students, so that teachers and students can have a convenient and quick understanding of the laboratory.**

Keywords—big data; training room information; comprehensive management; management solution

I. INTRODUCTION

In the teaching system of higher vocational colleges, practical teaching occupies a large proportion. Training rooms shall be the main place for practical teaching, as well as an important base for scientific research, social service, innovation and entrepreneurship. In recent years, as the construction of national model colleges, first-class colleges and brand specialty, a large number of campus practice base have been built, and a large amount of teaching instruments and equipment have been purchased, along with an increasing extension in schools' training sites, an obvious improvement in lab environment, and a significant increase in training room equipment level. With the rapid development of schools, the traditional manual management mode used by the school training room is so inefficient and backward that it cannot meet the needs of schools' development[1].

II. CURRENT SITUATION OF PRACTICAL TRAINING ROOM MANAGEMENT IN HIGHER VOCATIONAL COLLEGES

On the Internet, we reviewed multiple experimental and training centers websites as well as assets management department websites from higher vocational colleges of the same type and found that training rooms from most of higher vocational colleges have more than one management platform, but without data sharing among various management platforms, training rooms managers suffer big workload and all the teachers and students can't quickly know and understand the laboratory.

As the number of training bases on campus increases, it is inevitable that the establishment, adjustment and merger of laboratories will occur, increasing management workload of managers and making users unable to know the changes of training sites anytime and anywhere through the Internet or mobile devices.

As the laboratory changes, its information data will also alter, including information of managers, teaching and scientific research usage of the laboratory. Laboratory information data can't be stored and retrieved in time, so there exists repetitive data filling in the preparation of a variety of information reports.

The poor management of instruments and equipment in the training room. Firstly, without data sharing of management platforms, information isolated island has been formed and the whole-process management of instruments and equipment cannot be realized. Secondly, due to the lack of information communication, the utilization rate of some instruments and equipment in the training room is not high. The laboratory belongs to each second-level college, and each of them has its own special training room. As the number of interdisciplinary subjects increases, there is a phenomenon of repetitive purchase of equipment in the training room.

There are many types and quantities of low-value consumables and materials in the training room, including some chemical supplies. The management disorder has great potential safety hazards and waste in use. The administrators of the practical training room are aware of the need to change the traditional management methods and thoughts and are gradually using big data technology to strengthen the information management and improve the quality and efficiency of the management.

III. EXPLORATION OF INFORMATION CONSTRUCTION OF THE TRAINING ROOM BASED ON BIG DATA TECHNOLOGY IN OUR SCHOOL

A. Construction of the training room information platform

The information of training rooms is the most effective means to improve the quality and efficiency of laboratory management, mainly including information display, information resources and information management[2].

1) Laboratory information display--360 panoramic display of the training room environment

Laboratory information display mainly includes website construction, pictures of laboratory environment, 360 panorama display of laboratory environment and other information. Panorama technique is a new visual technology which develops rapidly and becomes popular in the world. It gives people a new sense of real presence and interactive feelings[3]. 360 panoramic display of the training room is an interactive display of virtual reality to travel around the panoramic training room, which can truly reproduce the environment of the training room with transparent and visualized images.

The general framework of panorama display in the training room of our school is shown in Fig. 1:
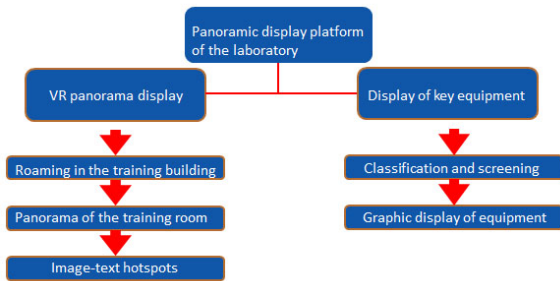

Fig. 1. The general framework of panoramic display of training rooms

It can be implemented in six parts:

(1) Firstly, shoot an aerial view with the UAV + panoramic camera, and flicker the tag point to show the location of the training building, as shown in Fig. 2

(2) Guide from the campus to the training building through the virtual surface arrows, as shown in Fig. 3

(3) Design the plane renderings of each floor according to the actual drawings, and display the spatial position of each training room, as shown in Fig. 4

(4) Click the corresponding training rooms to open the corresponding panorama

(5) Set up corresponding hotspots in the training rooms and introduce some equipment in the form of pictures and texts

(6) Set large equipment display in the training room, as shown in Fig. 5

Fig. 2. An aerial view
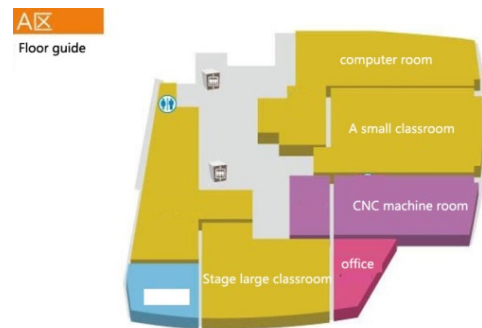

Fig. 3. A boot diagram
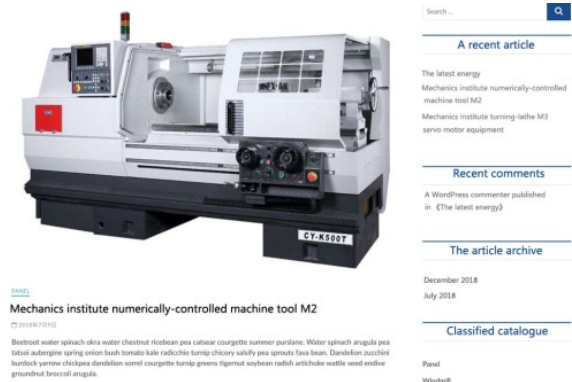

Fig. 4. Graphic renderings of each floor

Fig. 5. A display drawing of large equipment

By browsing the 360 panorama display of the training room on the Internet, teachers and students can intuitively understand its location, layout, equipment and other information in the school. They can use the mouse or touch control to achieve interactive activities of left and right, up and down, near and far, as well as large and small, which can enable teachers and students to better understand and use the training room[4]. As for panoramic display of key equipment, authorized teachers can view all details of large instrument and equipment online and view their technical data so as to make the information of large instrument and equipment public and facilitate its sharing.

2) Informatization of the training room resources

Information resources of the training room include all the basic information of the training room and they are updated in real time according to the construction of the training room. The construction of laboratory information resources is conducive to the collection of laboratory information, mainly including:

(1) Overview, functions, specialty orientation and administrators information of the training room

(2) Technical literature information of large equipment in the training room

(3) Class schedule of practical training sites

(4) Practical training projects set up in the training room

3) Information management platform of the training room

The information-based management of the training room is conducive to improving the management efficiency of the training room, which mainly involves the following management systems:

a) Equipment procurement system

It mainly records the process of equipment acquisitions, purchase, acceptance and settlement. The system allows data of each link to be inquired and counted for the convenience of supervision and management[5].

b) Instrument and equipment management system

The instrument and equipment is an important part of the state-owned assets of the school. The instrument and equipment management system shows an information-based monitoring and management process in terms of recording, changing, scrapping and cleaning of the instrument and equipment in the training room. Every year, the physical inventory of each training room is carried out through the data derived from the instrument and equipment management system, strengthening the management of the instrument and equipment in the training room, and realizing the consistency of the accounts of the instrument and equipment in the training room.

c) The low-value consumables and material system

Through the low-value consumables and materials system, managers can standardize fine management of low-value goods and materials from the training room, making a big progress from the original hand-filled documents to today's electronic information operation, and carrying out real-time and accurate grasp to the use and inventory of low-value goods and materials in training rooms. At the same time the system can make regulations and recycling to consumables and materials to avoid a waste of money on teaching use; besides, it is convenient for scientific research projects to purchase low-value durable goods and materials, so as to facilitate the audit[6].

d) Instructional management system

It mainly involves the site management of the practical training room in teaching, scientific research, innovation and entrepreneurship, as well as relevant teaching materials and information, such as the course schedule of the practical training room, practical training content, practical training projects and so on. Since each management system is constructed and managed by different departments, each management platform is developed independently, and the data is not shared, forming information isolated island.

B. Big data technology is used to realize data sharing of information management platform

Big data technology is used to realize the sharing of public information and the circulation of basic data in various information management systems[7].

Obtaining the data from the procurement system and the instrument and equipment management system can realize the whole-process information-based management of the equipment and equipment in the training room from application, demonstration, bidding, procurement, acceptance, accounting, usage to equipment elimination or scrapping, [8]thus realizing the whole-life cycle management of the equipment in the training room.

The registration system is used in the training room. Previous teachers of practical training need to hand fill the registration book of training rooms, which contain the class teacher, class time, classes, training courses, training projects, and equipment usage. If some teachers do not fill it in time or can't provide accurate data, the training rooms management does not reach the designated position, making some statistics data of the training room wrong. Now teachers scan QR code with their mobile phones by WeChat in class and enter the registration system. Teacher information is gained by WeChat, information such as class time, classes, training courses, training projects are automatically imported by the educational administration system, and equipment list is informed by equipment system. The teachers only need to register equipment usage in a class. On the one hand, it is convenient for teachers to operate; on the other hand, the management personnel of the training room can timely know equipment usage in the training room and carry out timely maintenance.

The summary report of training rooms data. Every year the school provides higher school laboratory information statistics of the ministry of education, which mainly includes the architectural area of the training room, equipment value, new equipment value, equipment number, training programs, man-hours and number of work position in training rooms, supplies expense, managers of training room and all come from information display platform, various information resources platform management system of the training room. With big

data technology, all kinds of information can achieve seamless connection so as to ensure timeliness and correctness of data statistics[9].

IV. Effects of information construction of training rooms based on big data

The information construction of the training room based on big data can't only effectively change the complexity and disorder of the traditional poly-department management in the laboratory, but also improve the efficiency and quality of the laboratory management in each department. The information construction of the training room based on big data takes the training room as the main line, and all the management resources are connected through the training room. Users can master all the information of the training room at one time, so as to achieve all-round management as well as dynamic whole-process management of the training room. Also, it makes the management of the training room standardized and systematized, from beyond control in the past to in full control at present.

The pure information platform starts from the perspective of managers, considering if the management is convenient and efficient. If the information of the training room is not open, and teachers and students consult the information of the training room through multiple departments, but all the information they find is basic information, which needs to be processed twice. The information construction of the training room based on big data has changed and put forward a new management solution of the training room. The laboratory information construction based on big data starts from the perspective of serving teachers and students, enabling teachers and students with different permissions to inquire relevant information conveniently and efficiently. The management concept of the laboratory has changed from that management convenience surpasses service convenience to that service convenience overwhelms management convenience[10].

V. Conclusion

The information construction of the training room based on big data in our school takes the training room as the main line and links all the information of the training room, which is convenient for teachers and students and improves the quality and efficiency of the management of the training room. New management solution has been put forward in the management of practical training room, aiming at serving teachers and students, accelerating the transformation of the management mode of practical training room, and providing strong digital support and guarantee for the construction of high-quality engineering higher vocational colleges as well as the improvement of laboratory management quality in our school.

References

[1] Hou Dejun, Sun Xiaozhi, Zhang Sherong, Li Yifei, Zhang Lei. Informatization construction of laboratory operation management guarantee system of Tianjin University [J]. Experimental technology and management, 2016, 33(08):4-8.

[2] Wang Huiyan, Liu Yuanxia, Sun Xun, Xian Xuefeng, Zhang Zhen, Li Jinxiang. Construction of laboratory comprehensive information management platform [J]. Experimental technology and management, 2017, 34(06):146-149.

[3] Baidu encyclopedia https://baike.baidu.com/item/360%E5%85%A8%E6%99%AF%E5%B1%95%E7%A4%BA/1039453

[4] Xie Yiyi. Discussion on the application of 360-degree panorama technology in campus display [J]. Science and technology communication, 2016, 8(12):103-115.

[5] Yin Liping. Exploration and research on strengthening standardized management of university government procurement [J]. China modern educational equipment, 2018(15):1-3.

[6] Jia Shenli. Construction of new working style of laboratory management department [J]. Experimental technology and management, 2016, 33(01):1-5.

[7] Meng Lingjun, Liu Yan, Li Chenliang, Jiang Dan, Meng Qingfan. Construction of informatization integrated management platform for university laboratories [J]. China medical equipment, 2019, 16(02):117-120.

[8] Jiang Yuanda, Wang Xiaoju, Yang Yuwei, construction of instrument and equipment management system under the whole life cycle management mode [J] laboratory research and exploration, 2008, 11 (37) : 289-292

[9] Yang Li. Current situation and countermeasures of informatization construction of educational administration in universities and colleges [J]. Industry and technology BBS, 2018, 17(19):249-250

[10] Hou Dejun, Sun Xiaozhi, Zhang Sherong, Li Yifei, Zhang Lei. Informatization construction of laboratory operation management guarantee system of Tianjin University [J]. Experimental technology and management, 2016, 8 (33) : 4-8