

Reform of Laboratory Construction and Experimental Teaching Model in Private Institutions of Higher Learning

Ya-Song LIU^{1,a,*}, Jie GAO^{1,b}, Jing-Guang WEI^{2,c}

¹Zhuhai College, Jilin University Zhuahi City, Zuhai, China

²School of Continuing Education, Jilin University Changchun City, China

^ayasongliu@163.com, ^b921330@qq.com

*Corresponding author

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Abstract. As an emerging private institution of higher learning, we consider building a high ended laboratory in which resources can be all well distributed and effectively shared as the primary principle of our laboratory construction in the long term. With this laboratory, we are enabled to create a brand new experimental system by establishing the connection of teaching and scientific research. We are committed to equip our students with comprehensive qualities and professional skills, and to constantly improve the experimental reform and innovation.

Introduction

The construction of undergraduate teaching laboratory is an important part of the basic construction of higher education, and an important platform to improve teaching quality and cultivate high-quality applied talents. For the specialty of science and engineering, the construction of the laboratory is particularly important. Jilin University Zhuhai college is an private institutions of higher learning, since established in 2004, is to develop the Pearl River Delta industrial development and social demand for talent, the establishment of computer science and technology, electronic information science and technology major, after being set up mechanical design manufacture and automation, automobile service engineering, architecture, chemistry and application pharmaceutical formulations, pharmaceutical engineering, software engineering, network engineering, microelectronics, medicine and a number of science and engineering majors. At the same time, some management disciplines are also set up.

At first, the laboratory was scattered in the first teaching floor. With the establishment of new science and management disciplines, it is very urgent to build a new and independent comprehensive experimental building. The board and school leaders attached great importance to the construction of undergraduate teaching laboratories and student practice places, and decided to build teaching and practice infrastructure such as comprehensive laboratory building in time. September 2007, comprehensive laboratory building of 28000 square meters and put into use, the same year in use as well as the ball (golf) training center. In 2008, the second experimental building, the mechanical and electrical training center, was put into use. At the beginning of 2009, the automobile engine experiment building and the teaching center of the logistics experiment practice were built. In 2010, the international trade and financial training room were built. With the delivery of these buildings, the college began to purchase experimental teaching instruments and equipment in large quantities. At present, the assets of experimental equipment and related computer software are about 510 million yuan. The improvement of the experimental teaching facilities and conditions indicates that the undergraduate experiment teaching in our hospital has entered a new stage.

Basic Ideas of Laboratory Construction in Our Hospital: Based on Long-term, Reasonable Distribution, Sharing Resources, Teaching and Scientific Research and Development Function Docking

From the introduction of the comprehensive laboratory of the Institute of construction, the college has repeatedly organized argumentation and conducted a number of investigations out of school. After determining the area of the whole laboratory and the relevant units in the campus, according to the particularity of different units, we need to consider the pure water demand, waste water and waste gas treatment in every room, such as water, electricity, air conditioning and chemical pharmacy [1, 2]. In the use of allocated space of every unit, we must reserve a certain area, so that there will be enough room for further discipline and research and application development in the future. In the process of perfecting the experimental teaching facilities, the following points can be done as much as possible:

Reference to the Model Construction of the National Experimental Demonstration Center

Our laboratory of chemistry and pharmacy is built on the basis of the national biological experimental teaching demonstration center of Jilin University and the national chemistry experimental teaching demonstration center of Jilin University. The construction standards are high, and the fixed facilities such as the experimental platform are completed once. That is to ensure the integrity of the construction of the laboratory, as well as the quality of construction, and save the cost of construction. At present, the laboratory area of about 7450 square meters, including organic, inorganic, ordinary, physicochemical, microbiological and other laboratory analysis instruments.

Pay Attention to the Integration of Resources and Realize the Sharing of Resources

After the completion of the comprehensive experimental building, the college will share resources and share the resources as much as possible during the process of the relocation of the whole hospital. We have focused on the computers of various departments and built a professional class laboratory with more than 800 high configuration computers and servers. By the unified management of the experimental teaching and laboratory management center of the College (hereinafter referred to as the experimental center), a unified arrangement of the professional courses and specialized basic courses of the whole school is arranged. It avoids the decentralized management of public experimental equipment, and leads to the waste of repeated purchase and so on. The utilization of equipment and equipment is improved, and the maintenance and management of the equipment are also helpful.

The experimental center also used the original resources of the Institute to expand the SCM Laboratory for the electronic information system, and built a large embedded system laboratory in the universities of Southern China area. On the basis of satisfying the teaching, the teachers and students use these laboratory resources to carry out scientific research and innovation activities. The students of the Department of computer science and Technology participated in the Fourth National Undergraduate Electronic Design Contest of the blot cup, and won the special prize of the software group. Department of electronic information science and technology students to attend the fifth in Cup National Undergraduate Electronic Design Contest of innovation won a grand prize, two prize two; in the sixth Borch Cup National University embedded design contest won first prize.

Pay Attention to the Link of Laboratory Function and Realize the Base

Mechanical design, mechanical and Electrical Integration Laboratory, Institute of programmable control laboratory, CNC process and programming laboratory, machining training center and automobile comprehensive laboratory, has realized the laboratory function facilities, cohesion and base, can satisfy the mechanical design, manufacturing and automation related experiments and professional automobile service engineering professional training teaching, also can the basic mechanical experiment, experiment, mechanical professional metalworking practice, CNC machining training, vehicle inspection and maintenance training, equipment maintenance and fault diagnosis of a variety of experimental teaching and training. In addition to completing the normal

teaching tasks, these labs are also open to students after school hours. Students can use their free time to enter the numerical control process and programming labs, and make their own programming. Through the numerical control machining practice in the laboratory, the students have certain practical operation ability of NC machine tools, NC machining process analysis ability and NC programming ability, which lay a good foundation for students to engage in NC programming related work in the future.

Set up a New Experimental Teaching System to Cultivate Students' Comprehensive Quality and Professional Skills

At present, the experimental teaching contents emphasize the embodiment and exertion of various functions such as real scene creation, programmed experiment validation, practical operation training, and creation interaction space and so on.

Give Full Play to the Function of Experiment Teaching Combining Theory with Practice

For the basic experiment, the confirmatory experiment keeps close contact with the related theories, and the purpose is to verify the basic theoretical knowledge. The error between the experimental results and the theoretical results is small, that is, the experiment is in accordance with the theoretical analysis. For the design type experiment, the purpose of the study is to investigate the students' comprehensive design and realization ability, and to evaluate the results according to the technical indexes achieved by the results of the experiment. Heavy program design, heavy results. We should carry out some research experiments appropriately, encourage exploration and research in the process of experiment, encourage students to try various kinds of programs as much as possible, and be inspired, trained and improved in exploration and research. The light result, the heavy process, does not use the success or failure to discuss the hero [3, 4]. For example, the integrated design course of electronic system, take the test, no written test, pay attention to the design report, sum up, analyze and solve the problems in the experiment.

We give full play to the combination of theory and practice of the experimental teaching characteristics, outstanding ability in each stage of the training focus, the formation of experimental training experimental basic operation ability of students, comprehensive experiments to cultivate students' comprehensive ability, design experiments to cultivate students' innovation consciousness and ability of the experimental teaching system.

Give Full Play to the Skills Training Function of the Actual Operating Platform

Machining Training Center of mechanical and Electrical Engineering Department of our hospital covers an area of 1800 square meters, is divided into ordinary machining training area, CNC training area, mold processing training area. The center of teaching facilities, the internship work is complete, has a CNC machining center, CNC lathe, CNC milling machine, EDM machine, wire cutting machine; general machine tools include: lathe, milling machine, grinder, planer, drilling machine, welding machine and fitters station 40. In addition, there is the injection molding machine, punching machine and material molding machine, can complete the Turner, Xigong, planer, grinder, electric welder, fitter, CNC machining, machining, mold manufacturing and other types of training and training tasks[5]. The common processing training area to complete the common practice of cars, milling, planning, pliers, grinding, drilling, boring and other types of work, students are required to hand the operation of the machine, complete the cutting of common parts, to improve the students' understanding of the common ordinary processing technology, to improve students' practical ability, in-depth understanding of common machining methods and the mode of production. In the training area, there are old machine tools and multiple sets of old moulds. Students can disassemble and install these equipment structures, deepen the understanding of common machinery and equipment structure and understand the motion principles.

Comprehensive experiment, automotive training center in our hospital covers an area of about 2000 square meters, including the structure of automobile engine disassembly laboratory, laboratory, engine performance laboratory, automobile maintenance engineering laboratory and automotive

electrical laboratory. Not only can students complete and careful observation car exhibits, cultural knowledge and learning automobile structure knowledge, but also through the transparent parts for model display, physical model, chassis parts anatomy display, automotive system demonstrator, micro perspective observation, the specific understanding of the internal structure of the car, can be in more hands-on training area based on the 8 sets of vehicle dismantling parts, maintenance, assembly and other comprehensive practical training ability. The laboratory of automobile maintenance engineering has two columns and column lifter, Bluetooth four wheel aligner, wheel dynamic balancing machine, tyre machine, and a number of decoder of special and general vehicle maintenance equipment, for students to understand and master the latest automotive engineering, electrical maintenance, inspection and maintenance of equipment and other aspects of knowledge and skills. The automotive electrical laboratory has automobile electric universal testing platform, multi-function nozzle cleaning test machine, multi-channel high-frequency automotive special oscilloscope and other automotive electrical inspection and repair equipment [6]. It is an experimental teaching place for automotive electrical and maintenance, vehicle sensors and other specialized courses. It provides a guarantee for students to understand and master the latest developments in the automobile industry and to become the highly skilled professionals who are in urgent need of the society.

Give Full Play to the Quality Training Function of Simulation Scene Simulation

We will part from classroom teaching to the diversion of simulation teaching laboratory, teachers become the "director" guidance, to cultivate the perceptual cognition, behavior consciousness, standardized operation and comprehensive quality of students, the need of social practice.

Ourism Management in our hospital department of Tourism Management Comprehensive Laboratory of a total area of 320 square meters, including the lobby of the training room, training room, dining room, training room and training room bar body training room five functional areas. There are hotel lobby, double standard room, advanced suite, Kangle center, Chinese and western restaurant, bar and so on. The facilities are completely arranged according to the four star hotel. The main work facilities and equipment of the front hall are set up, the office desk and chair, the telephone and the clock at the same time. The room training room is arranged in accordance with the standardized room. Restaurant training room and bar training room can fully meet the training teaching needs of "catering management", "wine knowledge and bar experience management" and other specialized courses. The restaurant's training room has a simulated Chinese restaurant, a western restaurant and so on. The bar training room has a standard bar with various kinds of wine. The physical training room has installed the large area mirror of the double side wall according to the requirement. A total area of 23000 square meters of Tourism Management Department of ball training center, Zhuhai city is the first by the universities themselves into the capital construction of golf course. The close combination of theoretical teaching, situational teaching and practical training provides a good training space for students to systematically and comprehensively master basic skills, service standards, service processes, and shape students' physical beauty and inner elegance.

The business administration department introduced the ERP sand table simulation course into the experimental teaching. The trainees were divided into several teams, and the students served as the different leadership roles of the management team respectively. Each team runs a The Virtual Corporation and is engaged in 4-6 consecutive accounting years. Through the intuitive enterprise sand table simulation of the actual operation of enterprises, many aspects related to their overall strategy, product development, production, marketing, sales, financial management, teamwork, let students experience the complete business process in the "game", the typical enterprise development process, understanding the correct business ideas and the management idea[7]. In short-term training, students will encounter various typical problems in business operation. They must find opportunities in time, analyze problems and make decisions, and try to ensure that companies grow continuously in fierce market competition.

By simulating the environment with changeable competition among enterprises, we give students the role of management and decision-making, emphasize the initiative and creativity of students, and emphasize the training of students' comprehensive ability.

Give Full Play to the Interactive Teaching Function of Exchange Display and Innovation Space

The Art Department of experimental teaching for many years to break the art not only with "teaching laboratory, number of well-known experts and professors" or "personal honour" set up special "studio" tradition, in the creation of the lab, in line with the spirit of innovation of experimental teaching, give it exchange exhibition, comment on the scene, interact with live function, "" the laboratory department of art. In the course of the combination of the theory and the hands-on ability, the teacher must go to the laboratory to go to the class and carry out the open field and exchange interaction. On the basis of stimulating students' innovative consciousness, we should observe and observe the works with visual personality, personality and creative thinking. We should fully communicate with teachers under the guidance and carry out personalized training in a targeted way. From the planning and design of the laboratory to the function display, the art department is trying hard to pursue the experimental item -- Training Project -- the connection and transformation between creative projects, from the collective classroom experiment to the personalized training of professional students. The teacher not only completes the classroom teaching, but also guides the students' individualized creation and hands-on ability, and accelerates the integration of the market demand.

Information Construction

The experimental center, in cooperation with the Department of computer science and technology, has taken the lead in building an experimental teaching website for the embedded curriculum system, which is used for auxiliary teaching. The experimental center, together with the relevant departments, has developed "experimental teaching equipment budget reporting, auditing system" and "experimental teaching low value and consumable goods management system", which has been put into use. The system can complete the declaration and audit work of the instrument and equipment procurement budget of various teaching units through the network, and real-time online management of experimental materials.

Summary

With the continuous expansion of the scale of education, how to train applied talents with more social needs has put forward higher requirements for the construction of experimental teachers and the construction of experimental technicians. The establishment of a combination of old experimental teachers, give full play to the old teacher's experience, the old with the new, young teachers grow up as soon as possible, at the same time, the stability of middle-aged teachers, the construction of a strong theoretical knowledge and practical experience of the teachers is the key to ensure the quality of experimental teaching, is also the focus of our future work.

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