

## Research on the operation mechanism and management mode of Mechanical Engineering experimental teaching center

Jiguang Jiang<sup>1, a</sup>, Yue Zeng<sup>2, b</sup>

<sup>1</sup> College of Mechanical and Electric Engineering, Changchun University of Science and Technology, Changchun 130022, China

<sup>2</sup> Information Comprehensive Office Jilin Province of Environmental Monitoring Center, Changchun 130011, China

<sup>a</sup>jiangjiguang1980@126.com, <sup>b</sup>lolly\_zeng@yahoo.com.cn

### Abstract

The experimental teaching center of mechanical engineering is an important place to cultivate students' engineering consciousness and practical ability. The quality of experiment teaching is closely related to the operation mechanism and management level. This article is from the characteristics of mechanical engineering experiment teaching, this paper discusses the mechanical engineering experimental teaching center management mode innovation and the establishment of a new operating mechanism.

### Keywords

Mechanical engineering, experimental teaching, management model.

### 1. Introduction

University is the carrier of training high quality and highly skilled personnel, laboratory is the implementation of quality education, training students' innovative spirit, practical ability and comprehensive quality of the main place, for the cultivation of high quality students with practical and innovative ability has a pivotal role[1]. The construction and development of experimental teaching center of mechanical engineering is very important for developing students' practical ability and innovative spirit. This paper mainly based on the construction of mechanical engineering experimental teaching center of ChangChun University Technology, the paper expounds and analyses the development of management mode innovation and operation mechanism of the center, through the continuous improvement of the rules and regulations, and effectively improve the construction level of mechanical engineering experimental teaching center.

### 2. Teaching operation mechanism of Mechanical Engineering Experimental Teaching Center

#### 2.1 Strengthen laboratory opening construction

University laboratory is the main place for the implementation of quality education, training students' innovative spirit, practical ability and comprehensive quality. Laboratory to different levels of students open, different disciplines, different grades of students are open to the laboratory to do the experiment, to provide students with the opportunity to experiment. To encourage students to take part in the problem of their own interest, production and life of the problem, to participate in the phenomenon of scientific research activities, through the literature, reference books and other information to design a specific experimental program and steps, the guidance of the teacher's examination after the experiment[2].

#### 2.2 Promote laboratory platform construction

Mechanical engineering experimental teaching center to break the boundaries between colleges, professional and inter laboratory, the implementation of the platform of management mode is the facilities, teachers, and material matching ".The experimental teaching center provides the

experimental platform for the experimental course of each college, and according to the experimental teaching curriculum has been determined to unify the experimental teaching arrangement, good start to use of instruments and equipment, laboratory supplies and other preparatory work. As a result of the use of the platform of management, each college, each professional uniform use of experimental venues, equipment, a variety of experimental materials, greatly reducing the consumption of the experimental operation, the maximum of the instrument and equipment, laboratory personnel and laboratory utilization, to achieve the low cost and high efficiency.

### **2.3 Promoting laboratory network and information construction**

Through efficient and fast network, students can view the teaching syllabus, electronic lesson plans, download multimedia courseware, video and other teaching resources; through the Internet students can better preview or review the contents of the experiment, accurate grasp of the knowledge. Through the experimental teaching website, teachers and students can carry out the network answer questions, and also can query the laboratory's division and use. Promoting laboratory network and information construction can make the teachers and students more reasonable to arrange the experiment teaching content, and to improve the level of experiment teaching and working efficiency[3,4].

## **3. The management mode of Mechanical Engineering experimental teaching center**

### **3.1 Normalized management of experimental project**

All kinds of experiments, which are based on the experimental teaching center of mechanical engineering, are arranged and managed by the center. At present, some of the science and engineering colleges and universities in the experimental class teaching there are some problems, for example, all of the theory course is to take a course as the unit to open the experiment, and the experimental teacher is most of the theoretical course of the teachers, in the course of the experiment, the lack of necessary supervision and management, it will lead to the whole course of the experimental system of the experimental system is messy.

In view of such problems, we have already built the experimental teaching center of mechanical engineering experiment, all of which are based on the experimental course of the experimental teaching center of mechanical engineering, no matter from the teachers, the experimental content and the experimental process control and management, etc., should be unified management, ensure the quality of the experimental class, the experimental course must be borne by the professional experimental teachers. Experiment course has a very important role in a complete curriculum system, the experimental course and theoretical course have great differences in the teaching method of content, and the two in the students' learning and understanding is also different, therefore, the teaching method of the theoretical course is not suitable for the study of the experimental course, therefore, must be independent from the experimental teachers to follow the experimental course content and curriculum system and teaching methods to teach, experimental teachers must be trained to work after the special experimental work.

### **3.2 Equipment maintenance personnel management**

Strengthen the training of students' practical ability and innovation ability, is the most important in the reform of personnel training mode in university. How to improve students' practical ability, how to improve students' practical ability, the experimental link plays an important role, however, the experimental equipment is the basis and guarantee of the experimental process can be carried out smoothly.

In order to guarantee the high quality of the experiment, the university has invested a lot of money in the laboratory resources and environment construction, the acquisition of a large number of advanced equipment and equipment, in order to avoid the abuse of equipment and instruments, the problem is no one in charge of the situation, for this part of the equipment and equipment must be set up to manage, ensure that equipment and equipment are always in the best running state, guarantee the

equipment and instrument hardware and software system upgrade and update, ensure that equipment and equipment can be maintained regularly, which can be traced to the failure of the equipment instrument, so that these resources have been able to meet the needs of the students' experiment and practice.

### 3.3 Management of experimental teachers

The experiment teachers in the whole course system of experimental teaching plays an important role in guiding role, the experimental teacher's workload and work mode is single, at the same time, it also has some risk in the use and operation of the equipment, therefore, the problem of the responsibility, power and benefit of the experimental teachers should be clearly defined. Laboratory personnel should continuously improve their own ideological quality and professional ethics, in order to ensure that the objectives and tasks can be successfully completed; to update and expand the relevant knowledge to meet the needs of the experiment reform; it should have good professional spirit, but also have a solid theoretical knowledge and rich practical experience.

On the one hand, the school can mobilize the enthusiasm of the teachers from the policy, improve the experimental teachers' subsidies, and give the appropriate incentives to the outstanding teachers; on the other hand, it is possible to create the conditions for the study and training of the teachers and technicians to improve the business ability and comprehensive quality.

The responsibility of the experimental teachers should be clear responsibility, no small experiment. Each of the equipment of the start, each section of the experimental class, each new experimental equipment training and use, etc., need to have a corresponding clear responsibility, to ensure the quality of the experimental course, to ensure that the experimental process of each process can be traced back[5].

### 3.4 Foreign exchange management of Experiment Center

After the experiment center was normalized to the experimental project, we should take the experimental teaching task of the whole school's mechanical and non mechanical basic course. How to improve the management level and strengthen the construction level of the experimental center, so that the experimental center has always been closely linked with the forefront of technology development, it is an important problem in the management of the experiment center that the experimental center has maintained strong vitality.

Foreign exchange is very important for the solution of these problems, and the experiment center of domestic and foreign well-known colleges and universities to promote the exchange, for example: the exchange of thoughts and ideas, exchange of experimental course system and content; with the modern factory and business to promote exchanges, exchange the latest cutting-edge technology, the introduction and understanding of the latest equipment. Only through the comparison, in order to find out other people's strengths, also found their own inadequacies, in order to avoid arrogance caused by closed; only through the comparison would encourage their own continuous development and expansion, In order to " better spinning than desiring the fish near the pool ", to pragmatic grasp construction[6].

## 4. Conclusions

China is a powerful country in engineering education. The rapid development of economy and society not only deeply changes people's life style, but also put forward new higher requirements for engineering education. After the innovation of modern mechanical engineering experimental teaching center of management mode and experimental teaching operation mechanism, not only to solve the problem of the management system, the waste of funds caused by redundant construction, the management of resources and the low utilization rate of resources and so on, , and greatly promote the laboratory management innovation, and promote the experimental teaching reform, the construction of the functional configuration, scientific and reasonable experimental teaching environment, to maximize the benefits of the construction investment, the experimental teaching center to achieve the optimal allocation of resources and resource sharing.

---

## References

- [1] Liang Ru-guo, Chen Jin-bao, Cao Qing-feng. The exploration and Practice of building innovation laboratory and raising innovation talent person. *Experimental Technology and Management*, Vol.23 No.9, pp.23-25, Sep. 2006.
- [2] Qi Long, Wang Wen-qiang, Sun Zhi-hong, Chen Guo-liang, Xu Shi-cai, Zhao Man-xing. Exploration and Practice of University's Laboratory Opening. *Acta Agriculturae Jiangxi*, Vol. 24 No.4, pp. 204-206, 2012.
- [3] Wang Chuan-sheng, Innovating Practice Teaching System of Giant Mechanical Discipline for the Need of Talent Cultivation, *Research and Exploration in Laboratory*, Vol. 26 No. 12, pp. 9-11, Dec. 2007.
- [4] HU You-an. Practice of Building the Mechanical Experiment Teaching Demonstration Center, *Experiment Science and Technology*, Vol. 8 No.5, pp.147-149, Oct. 2010
- [5] Jiguang Jiang. Reform and Research on the experimental teaching system of Mechanical Engineering, *International Journal of Science*, Vol. 2 No. 8, pp. 52-55, Aug. 2015.
- [6] Jiang Ji-guang, Exploration and Practice on Establishing a Demonstration Centre of Mechanical Engineering Experimental Teaching, *International Conference on Education and Educational Research*, pp.100-110, Aug. 2013.