

# *Research on the Problems and Improvement Countermeasures of Laboratory Management in Higher Vocational Colleges and Universities*

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**Keywords:** Higher vocational colleges; laboratory management; problems; improvement strategies

**Abstract:** Higher vocational colleges were founded at the beginning of the very rich teaching resources into the construction of hardware facilities, so as to better highlight the characteristics of schooling. For higher vocational colleges, the laboratory is their main base. Higher vocational colleges and universities to run a comprehensive technical advantage is also expressed in the laboratory construction of this element. Laboratory is often equipped with more advanced equipment and precious experimental materials, if damage occurs then the impact of the impact in addition to economic loss, will also have a significant impact on the school's experimental teaching work, so from the beginning of the establishment of the laboratory school must do a good job of laboratory management. However, it is found that the laboratory management work in higher vocational schools is not quite satisfactory, and the traditional way of coping with the problem is no longer able to co-ordinate the current problems, therefore, the school must make a good plan to optimize the laboratory management into practice.

Laboratory construction is a major work of higher vocational colleges, with the deepening of reform in China's higher vocational colleges and universities, changes in the national laboratory's sub-management institutions and systems will be explored to explore a more reasonable way of teaching and management of national laboratories, which will play an important role in the laboratories, and have a significant scientific value and practical significance for the cultivation of high-level talents<sup>[1]</sup>.

## **1. Analysis of the experimental situation in higher vocational colleges and universities**

With the progress of the times, the state is strongly supporting the development of higher vocational colleges and universities, they are fundamentally different from ordinary colleges and universities, and pay more attention to cultivate the skill-oriented talents needed by the society. In today's society, the demand for talents is increasing, and higher vocational colleges and universities should also seize the opportunity and strive to improve their own strength. Although people who have learned the relevant knowledge can be successful in their work, they need more efforts and dedication to really realize their potential. In order to meet the talent needs of today's society, higher vocational colleges and universities should strengthen education and teaching to ensure that students acquire

more skills and knowledge in the process of learning. Imagine a student who has no contact at all with the necessary equipment during several years of study, then he will not be able to meet the requirements for graduation. Higher vocational colleges and universities should be committed to cultivating practical talents with practical ability, and the construction of laboratories is the key to improving the quality of talent training. For this reason, higher vocational colleges and universities should strengthen the construction of laboratories and improve the teaching level, so that students can obtain more knowledge and skills in practice, thus stimulating the development of the school. In order to meet the school's development needs, higher vocational colleges and universities not only vigorously invest financial resources and begin to expand the scale of laboratories, but also actively raise funds to ensure the adequacy and reliability of laboratory equipment to meet the school's development needs. With the diversification of funding sources and investment destinations of higher vocational colleges and universities, laboratory management has become increasingly complex. In order to enhance the operational efficiency of laboratories, schools must strengthen the recruitment of professionals. At the same time, the number of laboratories is increasing due to the growing size of the school. Therefore, effective measures must be taken to improve management to meet the growing challenges. The introduction of effective measures should be taken to bring about a great improvement in the effective operation of laboratories, which can effectively motivate and discipline managers as well as maintain and improve the operation of laboratories so that they can better serve the development of the university. Its introduction will help to better utilize the value of the laboratories and will be effective in maintaining and improving the integrity of fixed assets<sup>[2]</sup>.

## **2. The main difficulties faced by the construction of laboratories in higher vocational schools**

### **2.1 The implementation of rules and regulations are not in place, the implementation is not strong enough**

Laboratory control is based on the establishment of scientific and reasonable rules and regulations, the system will affect the final effectiveness of the control, only carefully established system can improve the efficiency of the control, the system must also include the end-of-life provisions of the experimental instrumentation and equipment and reporting conditions and other requirements. However, in practice, the terms of claim for the loss or damage of experimental instrumentation and devices have not been established, and the provisions have not been perfected. In addition to the establishment of higher vocational colleges and universities with a management system on experimental instrumentation and equipment, there must also be provisions on the supervision and management of laboratory use, which also includes arrangements for laboratory ownership. For the time being, there are still problems with the regulations governing laboratory management in higher vocational institutions. The establishment of laboratories in higher education institutions is, of course, intended to bring the quality of classroom teaching to the school and to ensure that teachers must also instruct students to go into the school laboratories during the actual course. But the actual situation is that the experimental classes have become theoretical classes, and the arrangement of the school laboratories is not guaranteed.

Some school staff have a limited understanding of the rules and regulations, and if they do not understand the importance of the rules and regulations, it is impossible to implement them. Higher vocational schools include many specialties, and since each specialty requires different mechanical equipment, school laboratories must also be classified, and the selection of equipment must follow the requirements of the discipline. The regulations clearly state that when the equipment can no longer be utilized, it needs to be reported and processed for systematic repair. At the same time, in the case of instruments and equipment can not be utilized teacher to be able to follow the provisions of the timely reporting, in accordance with the provisions of the end-of-life instruments, equipment must be

moved out of the laboratory and centralized stacking to the designated area for maintenance. However, at present there is no one to deal with this problem, which has been reported to the end of the instrumentation which can only be unused in the laboratory<sup>[3]</sup>.

## **2.2 No regular maintenance of laboratory equipment**

And then high-grade, advanced equipment, such as not being able to apply the general economic value of scrap metal, laboratory equipment is the most critical normal operation. Therefore, in order to maintain the normal work of laboratory equipment, should regularly do a good job of maintenance. Maintenance work is not implemented, in turn, will restrict the normal use of laboratory equipment. In the country's active support of China's higher vocational school development, school scale is getting bigger and bigger, more and more students are admitted, professional classes more than several times the previous. The increase in the number of students also increases the number of laboratory equipment used. In addition, since the school is the main platform for students' experiments, they are able to enter and exit the laboratories at will to carry out practical activities since the laboratories are open to students. This lengthens the running time of laboratory instruments, and the switching time is lengthened accordingly. In order to further increase the life of the equipment, it is necessary to carry out regular maintenance and inspection. However, there is a big difference between what is actually done and what is imagined. In addition, schools focus on the purchase of teaching equipment and do not pay as much attention to the maintenance of the machines. Even if teachers use the equipment during lessons, they do not carry out simple maintenance. In addition, since the schools do not have specialized technicians to carry out maintenance work, they can only coordinate with the specialized units when problems occur in the laboratory instrumentation units, and the specialized units will send their staff to repair them in order to solve the problems. Laboratory instruments and equipment must be replaced frequently, but because the old instruments and equipment purchased cannot be placed in accordance with the regulations, so the new instruments and equipment must also be maintained, if the maintenance work is not paid attention to, resulting in damage to the instrumentation<sup>[4]</sup>.

## **3. Laboratory management countermeasures in higher vocational colleges and universities**

### **3.1 Improve various rules and regulations and standardize management procedures**

Currently used rules and regulations have been formulated, no scientific, when the reality of the problem can not be dealt with on the basis of rules and regulations. Therefore, the establishment of rules and regulations has been the key issue of laboratory management in Chinese higher vocational schools, and it is urgent to put this work on the agenda. At the same time, some people are actively encouraged to bring support to the establishment of the system through their experiences and ideas. Insufficient implementation of rules and regulations is still due to insufficient attention to laboratory management, so managers must further raise the level of attention to the implementation of the policy of subordinate care, multi-level management, each link must be assigned to the appropriate staff. Laboratory instrument acquisition, laboratory equipment scrapping approval, laboratory equipment maintenance of these jobs gradually assigned to the hospital room, in the next layer of implementation, and finally fell on the head of the individual. Which link on what happens to find the department in charge, and at the same time to make treatment, so that employees recognize the seriousness of the problem, so that the real realization of the role and responsibility of the same, to achieve a level of good management level. Laboratory control processes need to be improved. The school's lecture schedule varies from program to program, but there is no shortage of teachers arranging for students to work in labs outside of the scheduled class time. When this occurs, it is impossible to identify the

person responsible, and in order to get to the root of the problem, teachers must be told that they must work strictly according to the schedule and that no alternation of theoretical and laboratory classes can occur. In order to make sure that the responsible person can be found quickly after a problem occurs in the laboratory equipment, the university stipulates that each faculty and department should make an appointment to register when using the equipment, act according to the procedure when using the laboratory, and make a record when the laboratory is used up with the date and the responsible person written on it. In addition, the details of equipment scrapping and damage compensation should also be recorded. Take the management of pathology tissue sections as an example, most of the section loss and damage come from the laboratory class, so we should formulate a compensation system for section loss. In the process of the first internship class, teachers should emphasize this compensation system for students, for rheumatic myocarditis and other more valuable sections should be clearly emphasized, so that students cherish these valuable experimental materials<sup>[5]</sup>.

### **3.2 Emphasize the construction of maintenance team**

Laboratory instrumentation equipment failure often exists suddenly, so it is possible that the problem of instrumentation equipment failure may occur in the test process. As higher education institutions focus on the investment of laboratory equipment, a large number of laboratory instruments have been purchased.

So the establishment of the maintenance team is the first task. In addition, the school can also be entrusted with the method of hiring the company's technical people to carry out equipment maintenance. But at the same time, due to the current higher vocational colleges and universities are equipped with more modern instruments and equipment, instrumentation and equipment structure is also more complex, so it is necessary to maintain the personnel must have a higher level of professional and technical level as well as more patience. For example, in the management of large specimens, we require maintenance personnel to do timely treatment of damaged specimens, for some specimens lack of fixative, we must do timely replenishment or replacement of liquid. If there are conditions, we require to be able to establish a set of perfect specimen database management system<sup>[6]</sup>. The lack of laboratory specimens can be added in a timely manner, but also to avoid the blind production of duplicate specimens, not only to improve efficiency but also to save resources<sup>[7]</sup>.

### **3.3 Research and demonstration before the purchase of instruments and equipment**

Before purchasing instruments and equipment, it is necessary for experienced professional laboratory staff, administrators and school leaders to participate in the preparation of a comprehensive acquisition plan based on the school's overall curricular development goals, giving full consideration to the actual needs of different systems, and combining the latest technology, the best use of the results, and the lowest cost, to ensure that all experimental instrumentation and equipment are of the optimal quality, quantity, manufacturer, and model. The quality, quantity, manufacturer and model of all instruments and equipments should be optimized. A thorough research and demonstration should be carried out before the purchase of equipment, so as to avoid the purchase of duplicated equipment or equipment that may be left unused<sup>[8]</sup>.

### **3.4 Supervision of the procurement process of instruments and equipment**

In order to guarantee the experimental requirements, higher vocational colleges and universities should strictly control the quality of purchased equipment and experimental materials. However, the price of instruments is also quite confusing, in addition to the difference in the price of the products,

the quality of the instruments and equipment is also different. Therefore, people must be highly careful when purchasing experimental instruments and equipment, and those involved in the purchase must also go deep into the market to know what is the integrity of the business community, what vendors have low qualifications, and must not choose the wrong business purchased by the quality of substandard products. In terms of pathology practice class in the section, the bulk of the specimen storage management, we need to use OLYMPUS digital camera (5 megapixels) to collect material, while the typical section of OLYMPUSBX51 microscope, JVC digital camera to analyze the collection of material. These equipments are very expensive, and if there are quality problems, it will bring a huge burden to teaching as well as research work. Schools should also set up a special fund, dedicated to the basic construction of the laboratory and the purchase of experimental instruments and equipment, to avoid some people in the huge profits under the guidance of the choice and unscrupulous merchants and procurement of three products. In order to prevent this, an independent organization needs to be established to carry out systematic oversight, thus bringing the activities of the procurer within the scope of oversight<sup>[9]</sup>.

### **3.5 Strengthening the construction of the laboratory technician team**

The success of a laboratory, in addition to its advanced instruments and equipment, good environmental conditions, but also need a dynamic, excellent quality, creative team of experimental technology personnel, to be able to truly reflect its value.

#### **3.5.1 Strengthen the quality education of the team and emphasize the team's business training**

In order to better build and manage the laboratory, we need to set up a solid theoretical foundation, proficiency in advanced technology, love of work, dedication, innovation, the pursuit of truth of the experimental team. With the development of the times, the communication and integration of various fields and the rise of new fringe disciplines, higher vocational colleges and universities are increasingly demanding the quality of experimental technicians. In order to better serve the society, we have to build a set of complete training mechanism for experimental teachers, and continue to improve the professionalism and management ability of experimental technicians in order to satisfy the social demand. After continuous learning and practicing, the theoretical knowledge and practical skills have been greatly improved, which will bring positive impact on the development of the laboratory<sup>[10]</sup>.

#### **3.5.2 Focus on the stability of the team and promote the rationalization of team structure**

In order to ensure the smooth progress of experimental teaching and scientific research experiments, and to improve the quality of experimental teaching, we should set up a team of experiments in higher vocational colleges and universities with good academic background, professional knowledge, vocational skills, and rich experience, and they will become the academic pillars of the laboratory and provide a strong support for experimental teaching<sup>[11]</sup>.

#### **3.5.3 Introducing new incentive mechanism and competition mechanism to give full play to the enthusiasm and creativity of experimental technicians**

In order to give full play to the potential of experimental technicians and improve their abilities, we must adopt effective policies and measures to motivate them to realize their potential and fully demonstrate their intellectual talents. These policies and measures should focus on stimulating the motivation, initiative and creativity of laboratory technicians and encouraging them to actively participate in training so as to achieve optimal learning outcomes. For some laboratory technicians

who can bring optimization and innovation to laboratory management, we can give them appropriate rewards <sup>[12]</sup>.

#### 4. Conclusion

The establishment of laboratories in higher vocational colleges plays a great function in practical teaching and provides a basis for the development of professional talents. Laboratory is a valuable asset of higher vocational colleges and universities. In order to make the laboratory give full play to its role in the long term it is necessary to pay attention to laboratory management. Relevant departments must take the reality into account, from several aspects to ensure the smooth operation of the laboratory, for normal teaching and research to make sure.

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