

Laboratory Construction and Management

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Abstract: Laboratory construction and management play an important role in the field of modern science and technology. This paper mainly discusses the problems related to laboratory construction and management, including the planning and design of laboratory construction, the purchase and configuration of experimental equipment, laboratory safety management and environmental protection. Through the research and discussion of laboratory construction and management, in order to provide reference and reference for laboratory construction and management.

1. Introduction

The laboratory occupies a very important position in the talent cultivation system, and plays an irreplaceable role in better guiding talents to closely integrate theory with practice, cultivating talents to improve their corresponding innovative spirit and practical abilities^[1]. The concept of talent education in our country has been continuously updated, and the construction of laboratories is a work that closely combines innovation and practicality. During the experiment process, it can cultivate talents' hands-on ability, problem-solving ability, and analytical ability, and also better stimulate their innovative spirit and consciousness, improving their corresponding innovation ability and comprehensive ability^[2-3]. However, the construction of most laboratories in China is currently in its early stages, and there are still many management issues. For example, the management system of the laboratory is not perfect and cannot adapt to actual needs. The most obvious issue is that the safety management of the laboratory has not been given sufficient attention. Therefore, various universities must attach great importance to laboratory construction and management work.

The construction of the laboratory aims to combine theoretical teaching with experimental teaching work, improve the comprehensive quality of experimental technicians, improve the overall software and hardware level of the laboratory, and achieve the goal of cultivating students' practical ability, innovative consciousness, and integrating theory with practice^[4]. This article will delve into laboratory construction and laboratory safety management, and provide reference and reference for laboratory construction and operation through research and exploration of laboratory construction and management.

2. Planning and Design of the Laboratory Construction

The planning and design of laboratory construction is an important link of laboratory construction^[5]. The planning and design of the laboratory need to consider the use, area and layout of the laboratory.

First of all, the use of the laboratory, the area and layout will be different. For example, the research laboratory needs a larger area to install more experimental equipment; the teaching laboratory needs more experimental tables and teaching tools to better meet the teaching needs. Therefore, in the planning and design stage of the laboratory construction, reasonable planning and design should be carried out according to the use of the laboratory.

Secondly, the layout of the laboratory needs to consider the ventilation, lighting, safety and other aspects of the laboratory. The ventilation design of the laboratory needs to consider the circulation and discharge of airflow in the laboratory to ensure fresh and clean air in the experimental room. The lighting design of the laboratory needs to consider the adequacy of the light in the laboratory, so that the experimenter can better carry out the experimental operation. The safety design of the laboratory needs to consider the safety of the equipment and laboratory in the laboratory to ensure the personal safety of the laboratory personnel.

Finally, the planning and design of the laboratory construction need to follow the relevant norms and standards to ensure the quality and safety of the laboratory construction. For example, laboratory construction needs to follow the "Laboratory Construction Code" and other relevant norms and standards to ensure the quality and safety of laboratory construction. The planning and design of the laboratory construction need to consider the use, the area and layout of the laboratory to meet the needs and requirements of the laboratory.

To sum up, the planning and design of laboratory construction are the important links of laboratory construction. The planning and design of the laboratory need to consider the use, the area and layout of the laboratory to ensure the construction quality and safety of the laboratory ^[6].

3. The Purchase and Configuration of Experimental Equipment

The purchase and configuration of experimental equipment is a very important part of the scientific research work, which directly affects the quality and efficiency of the experiment ^[7]. The following will introduce some basic principles and precautions for the purchase and configuration of experimental equipment.

3.1. The Principle of Purchasing Experimental Equipment

First of all, to choose a reliable quality brand and model. When choosing experimental equipment, we should choose a reliable brand and model to ensure the quality and performance of the equipment. To choose the appropriate equipment according to the experimental purpose and requirements, different experimental purposes and requirements require different equipment, and the appropriate equipment should be selected according to the specific requirements of the experiment. Secondly, when selecting the experimental equipment, the performance and function of the equipment should be considered, and the equipment that meets the experimental requirements should be selected. The price and maintenance cost of the equipment should also be considered to ensure the economy and feasibility of the equipment. In addition, we should also choose the manufacturers or agents who can provide perfect after-sales service to ensure that the repair and maintenance of the equipment can get timely support and service.

3.2. Configuration of the Experimental Equipment

When allocating the experimental equipment, the experimental equipment should be rationally configured according to the experimental requirements and objectives. The quantity and specification of the equipment should match the experimental requirements to ensure the full utilization and economy of the equipment. According to the process and requirements of the experiment, the working

order and use time of the equipment should be reasonably arranged to ensure the smooth progress of the experiment. According to the area and layout of the laboratory, reasonably arrange the equipment placement and ventilation conditions, to ensure the safety and health of the laboratory. For the equipment that needs to be used frequently, adequate maintenance and maintenance should be given to ensure the long-term stable operation and service life of the equipment.

3.3. Maintenance of the Experimental Equipment

When using the experimental equipment, the equipment should be checked and maintained regularly to ensure the normal operation and use effect of the equipment. For the parts that need to be replaced, replace them in time to ensure the integrity of the equipment. For the equipment to be cleaned, it should be cleaned and disinfected regularly to ensure the hygiene and safety of the equipment. For the equipment requiring lubrication, regular lubrication maintenance should be carried out to ensure the normal operation of the equipment. The equipment requiring calibration shall be performed regularly to ensure the accuracy and reliability of the equipment ^[8].

In short, the purchase and configuration of experimental equipment is a very important link, which is directly related to the quality and efficiency of the experiment. Only the reasonable selection and configuration of experimental equipment can improve the quality and efficiency of experiments, so as to better complete the scientific research work.

4. Laboratory Safety Management

Laboratory safety management refers to the comprehensive, systematic and scientific management and control of the laboratory environment and experimental operations, so as to ensure the personal safety of laboratory personnel and the accuracy and reliability of experimental data. Laboratory safety management is an important part of laboratory management, but also the basis to ensure the normal operation of the laboratory and scientific research. Below, we will discuss from the necessity of laboratory safety management, the content of laboratory safety management, laboratory safety management measures and other aspects.

4.1. The Necessity for Laboratory Safety Management

First of all, to ensure the personal safety of laboratory personnel. There are many risk factors in the laboratory, such as chemicals, high temperature, high pressure, high voltage, etc. If effective safety measures are not taken, it will cause harm to the laboratory personnel, and even endanger life safety.

Secondly, the accuracy and reliability of the experimental data should be ensured. The accuracy and reliability of laboratory data is the guarantee of scientific research results, and the improper laboratory safety management will affect the accuracy and reliability of experimental data, thus affecting the authenticity and credibility of scientific research results.

Finally, to ensure the normal operation of the laboratory. The laboratory is an important part of scientific research institutions. If the safety management of the laboratory is not proper, it will affect the normal operation of the laboratory, thus affecting the achievement of scientific research results and the development of the laboratory.

4.2. The Content of the Laboratory Safety Management

The first is the safety management of the laboratory environment. The safety management of the laboratory environment includes the management of ventilation, lighting, temperature, humidity and other aspects of the laboratory, as well as the management of firefighting, anti-theft and explosion-

proof aspects of the laboratory.

The second is the safety management of the experimental operation. The safety management of the experimental operation includes the preparation work before the experiment, the operation specification in the experiment, and the cleaning work after the experiment.

And the safety management of the experimental equipment. The safety management of experimental equipment includes the management of the purchase, installation, maintenance and maintenance of experimental equipment, as well as the management of the troubleshooting and maintenance of experimental equipment.

Finally, the safety management of the laboratory personnel. The safety management of laboratory personnel includes the safety education and training, safety awareness and safety responsibility of laboratory personnel.

4.3. Measures for Laboratory Safety Management

First, to establish and improve the safety management system. The laboratory shall establish and improve the safety management system, including the laboratory safety rules and regulations, the laboratory safety operation procedures, the laboratory safety management manual, etc., to standardize the laboratory safety management work^[9].

Second, to strengthen the management of the laboratory environment. The laboratory should strengthen environmental management, including ventilation, lighting, temperature, humidity and other aspects, to ensure the safety and comfort of the laboratory environment.

Third, to strengthen the management of experimental operation. The laboratory should strengthen the management of the experimental operation, including the preparation work before the experiment, the operation specification in the experiment, and the cleaning work after the experiment, so as to ensure the safety and accuracy of the experimental operation.

Fourth, strengthen the management of experimental equipment. The laboratory should strengthen the management of experimental equipment, including the management of the purchase, installation, maintenance and maintenance of experimental equipment, so as to ensure the safety and normal operation of experimental equipment.

Finally, strengthen the management of laboratory personnel. The laboratory should strengthen the management of laboratory personnel, including the safety education and training of laboratory personnel, the safety awareness and safety responsibility of laboratory personnel, so as to ensure the safety and health of laboratory personnel.

To sum up, laboratory safety management is an important part of laboratory management, and also the basis to ensure the normal operation of laboratory and scientific research. The laboratory shall establish a sound safety management system, and strengthen the management of the laboratory environment, laboratory operation, laboratory equipment and laboratory personnel, so as to ensure the safety and normal operation of the laboratory.

5. Laboratory Environmental Protection

Laboratory environmental protection refers to a series of measures taken in the laboratory to protect the environment in the laboratory from pollution and damage, but also to protect the health and safety of the laboratory staff. With the continuous development of science and technology and the continuous popularization of the laboratory, the laboratory environmental protection is also getting more and more people's attention^[10].

First of all, the laboratory should establish a scientific safety management system. Laboratory management personnel should develop a detailed safety management system, and clarify the safety production responsibility and safety operation procedures in the laboratory. At the same time, safety

education and training for laboratory staff should be strengthened to improve their safety awareness and safety skills.

Secondly, effective pollution prevention and control measures should be taken in the laboratory. Laboratory work often produces a variety of harmful substances, such as chemicals, radioactive substances and so on. In order to prevent these substances from causing harm to the environment and the human body, the laboratory should establish sound pollution prevention and control measures. For example, establish a chemical management system to store and label chemicals; strengthen the maintenance and management of laboratory ventilation facilities to ensure that the laboratory air quality meets the standards; establish a radioactive material management system, and conduct strict management and monitoring of radioactive substances.

In addition, laboratories should also strengthen the management and treatment of waste. Waste generated in laboratory work, such as chemical waste liquid, waste reagents, waste equipment, etc., all need to be properly managed and treated. The laboratory should establish a waste management system to standardize the collection, classification, storage and treatment of waste. At the same time, the monitoring and detection of waste should be strengthened to ensure the safety and environmental protection of waste disposal.

Finally, laboratories should also enhance their environmental monitoring and assessment. Hazardous substances produced in laboratory work may have effects on the surrounding environment and ecosystem. Therefore, the laboratory should establish an environmental monitoring and evaluation system, regularly monitor and evaluate the environment around the laboratory, find out the environmental problems in time and take corresponding measures to solve them^[11].

To sum up, laboratory environmental protection is an important measure to ensure laboratory safety and environmental protection. Laboratory management personnel should earnestly implement the principles of laboratory environmental protection, strengthen the management and monitoring of the laboratory environment, ensure the health and safety of laboratory staff, but also protect the safety and health of the surrounding environment.

6. Problems and Countermeasures in Laboratory Construction and Management

Laboratory construction and management are an important basis for scientific research, but there are also many problems in practice. The following three aspects from the laboratory construction, equipment management and safety management to discuss the laboratory construction and management problems, and put forward the measures to deal with the problem.

Laboratory construction is the foundation of scientific research, but there are the following problems in practice:

First of all, the design is unreasonable, the laboratory design should be reasonable planning according to the actual demand, scientific research direction and the number of users and other factors, but some laboratory design is unreasonable, resulting in insufficient equipment configuration, space waste and other problems. This should be reasonably planned and designed according to the actual needs of the laboratory to ensure that the laboratory construction meets the needs of scientific research and the actual situation.

Secondly, the quality is not up to standard, in the laboratory construction, there are some construction units in order to save the cost, choose inferior materials or unqualified equipment, resulting in the laboratory construction quality is not up to standard. In this regard, the supervision and management of the laboratory construction quality should be strengthened to ensure that the laboratory construction meets the relevant standards and norms.

Finally, the equipment configuration is insufficient, the equipment configuration in the laboratory construction, can not meet the needs of scientific research. We should rationally allocate the

equipment according to the scientific research direction and needs of the laboratory to ensure that the construction of the laboratory meets the needs of scientific research.

Laboratory equipment is an important guarantee for scientific research work, but there are the following problems in practice:

First, the equipment maintenance is not timely: the laboratory equipment maintenance is not timely, resulting in high equipment failure rate, affecting the progress of scientific research work. We should establish the equipment maintenance system, regularly check and maintain the equipment, to ensure the normal operation of the equipment. Second, the improper use of equipment, the improper use of laboratory equipment, resulting in equipment damage or failure. Training and management of the equipment use should be strengthened to ensure the normal use and maintenance of the equipment. Third, the equipment update is not timely, the laboratory equipment update is not timely, can not meet the needs of scientific research. The equipment should be updated and upgraded regularly to ensure that the performance and function of the equipment meet the scientific research requirements.

Laboratory safety management is an important guarantee for scientific research work, but there are the following problems in practice:

First, the safety awareness is not strong, the laboratory staff safety awareness is not strong, prone to safety accidents. Safety education and training should be strengthened to improve the safety awareness and safety skills of laboratory staff. Second, the safety facilities are not perfect, the laboratory safety facilities are not perfect, prone to safety accidents. The construction and management of laboratory safety facilities should be strengthened to ensure the perfection and normal operation of laboratory safety facilities. Third, the safety management system is not perfect, the laboratory safety management system is not perfect, easy to occur safety accidents. A perfect laboratory safety management system should be established to strengthen the supervision and management of the laboratory safety management to ensure the safe operation of the laboratory.

7. Conclusions

This article mainly discusses the issues related to laboratory construction and management, and proposes some suggestions and measures. The standardization, scientificity, and modernization of laboratory management are new requirements for current laboratory construction and management. The level of laboratory management is an important indicator for measuring the quality of scientific research work and the construction of scientific theories. It is necessary to carefully plan and scientifically manage the laboratory, and strive to build it into a practice and innovation base with standardized design, scientific management, and leading technology, in order to better promote the integration of theory and practice and improve the overall scientific research level of China.

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