Evaluating and Improving the Laboratory Safety Management in University Business Schools

Shushi Wang

Saxo Fintech Business School, University of Sanya, Sanya 572000, China.

Abstract: This paper explores laboratory safety management in modern business schools, specifically focusing on the management of networks and computers. Laboratory safety is crucial for promoting teaching and scientific research, especially given the increasing use of information technology in business schools. The paper presents a case study of laboratory safety management practices at the University of Sanya and proposes an optimized model for modern business schools.

Keywords: Laboratory Management; Business School Laboratory; Safety Management Platform; Laboratory Safety

Introduction

Laboratories are essential for teaching and research in business schools in Chinese universities. However, laboratory safety has become an urgent issue, and universities are optimizing their laboratory management models to address concerns. The "Double First-Class" project has increased teaching and research activities in business schools, but inadequate funding and safety education have hindered laboratory development. Applying information technology to improve laboratory safety management has become a frequently adopted approach. The Saxo Fintech Business School of the University of Sanya has optimized its intelligent asset trading laboratory to develop a more efficient laboratory safety management system.

1. An Analysis of the Current State of Laboratory Safety Management in Chinese University Business Schools and the Challenges Faced

As network information technology becomes more widely adopted in business schools, laboratory safety management is facing new challenges. While some universities have established safety management systems, practical issues such as network security incidents and personnel shortages remain. Neglecting necessary maintenance and safety guarantees when purchasing equipment can also lead to safety hazards. Renovating old buildings for laboratory use can be difficult due to budget and space limitations. Outdated equipment, aging laboratory wiring, and slow construction are common issues due to limited procurement funds. Additionally, heads of business school laboratories may lack a professional background in science and engineering. To address these challenges, universities need to establish effective safety management mechanisms and departments, allocate appropriate resources and personnel, and prioritize necessary maintenance and safety guarantees when purchasing equipment.

1.1 Challenges Stemming from Insufficient User Safety Awareness and Unclear Responsibility Systems in Laboratory Management

Laboratory safety is a critical concern in Chinese universities, and lack of knowledge about safe maintenance of laboratory equipment is a major issue among laboratory users. This issue is compounded by a lack of understanding of safety management and insufficient emphasis on safety in laboratory training and education. As a result, users are often more comfortable with using laboratory equipment than with maintaining it safely. This, in turn, leads to poor emergency and danger handling capabilities, which can be particularly problematic in the event of an accident. Although universities do

offer laboratory safety education, the traditional classroom teaching format is often inadequate due to a lack of flexibility, low teaching quality, and poor timeliness of knowledge. Additionally, universities typically do not require safety responsibility agreements or guarantees with laboratory equipment users, leading to unclear obligations and ineffective implementation of safety management systems. Addressing these issues is crucial for improving laboratory safety in Chinese universities.

1.2 Challenges and Shortcomings in the Laboratory Safety Management System

China's laboratory safety management system lacks unified planning, particularly in business school laboratories, leading to repetition, contradictions, and a lack of overall planning. Outdated safety regulations and insufficiently trained personnel increase potential risks. Measures often prioritize accident handling over prevention and lack scientific evaluation, leading to frequent accidents.

2. Innovative Mechanisms for Enhancing Laboratory Safety in Business Schools

Understanding unique characteristics of business school laboratories is essential to address safety issues. They feature a variety of computing devices, multi-screen collaborative scenarios, and designated course software. Innovative measures based on practical experiences at the Saxo Fintech Business School can address safety management concerns.

2.1 User Information Security Perspective

The risks of personal information leakage and research data outflow have become common in laboratory settings in the "big data" era in China. Prioritizing the security of users' personal information is crucial for laboratories in higher education institutions. This section proposes innovative measures for enhancing laboratory safety management in business schools:

2.1.1 Establishing a System Restore Point Through a Switch

A laboratory switch connects multiple devices and manages network traffic, improving performance, increasing security, and facilitating efficient management. Business school laboratories should have a switch to prevent improper user operations and ensure devices start in their original state. Network administrators can update software and fix security vulnerabilities as necessary, reducing long-term maintenance costs.

2.1.2 Review of Pre-installed Software

The laboratory should review the pre-installed software on the restored point computer system to ensure that there is no software that engages in internal charging, pop-up ads, or collects user information. The laboratory should limit the use of computer software to official licensed software and system-attached software. For instance, when selecting a pre-installed input method, input methods with advertisements and pop-ups should be avoided, and priority given to the Windows system's Microsoft Pinyin Input.

2.1.3 Establishing a Blacklist of Unsafe Websites

To strengthen laboratory network security, business schools can restrict user access to websites through network management. Setting up a "webpage blacklist" on the gateway firewall or modifying the system restore point's hosts file can prevent access to malicious web pages and pop-up ads at the root level, reducing computer virus infections and avoiding information leakage.

2.2 Laboratory Equipment and Network Security Perspective

Inadequate preventive measures for laboratory construction and weak network security are prominent issues in university business schools. The wide range of devices and distributed locations pose significant management challenges compounded by user awareness and malicious intent. The lack of an effective global network security protection system exacerbates this issue, leaving the laboratory vulnerable to serious losses.

2.2.1 User Account Management

A laboratory user account system should be established to assign a unique account to each user for login, and to effectively manage their personal information. The system should restrict non-routine laboratory users from accessing the laboratory and increase the costs for routine users who engage in illegal activities. In the event of a laboratory accident, effective accountability can be achieved through user identification.

2.2.2 Strengthen Security Education

Universities can systematically build an online security education and self-testing platform and require laboratory users to watch security training and pass security tests before using laboratory equipment. Test results should be linked to user account login permissions and laboratory access control systems. Users who fail the test should be denied access to the laboratory for data querying and learning.

2.2.3 Firewall Implantation

Firewalls create a protected barrier between internal and external network environments, blocking unsafe network factors and limiting unauthorized access. They can filter out unsafe services and illegal users, detect and alert network attacks, and record information content and activities.

2.2.4 Device Management System

Each laboratory device should be assigned to a user who is responsible for its maintenance and inspection. The person in charge should conduct daily inspections of the equipment and report any damages to laboratory management personnel in a timely manner. This can help reduce the management cost of individual devices in the laboratory.

2.2.5 Increase Funding

Investment in hardware facilities is critical to ensuring laboratory safety. By increasing investment, universities can actively replace and upgrade old equipment, strengthen laboratory safety standards, and resolve existing problems. The laboratory should allocate a fixed proportion of funds for post-maintenance of equipment and network security maintenance.

2.2.6 Improve Security Management System

A well-constructed security management system is essential to laboratory safety. Universities should put user safety first and establish reasonable and easy-to-implement rules and regulations that effectively guide laboratory users. Emergency plans for responding to laboratory safety accidents should be formulated and implemented in a timely and effective manner.

2.3 User Safety Perspective

2.3.1 Safety Equipment, Warning Signs, and Emergency Response Manuals

The laboratory should be equipped with appropriate safety equipment such as fire extinguishers and first-aid kits, and warning signs and cautionary slogans should be placed near each device. Emergency response manuals should also be introduced to facilitate prompt and effective handling of accidents.

2.3.2 Cable Shielding and Routing

To minimize the risk of accidents, the laboratory should limit users from tampering with cables and avoid the exposure and entanglement of power, network, and other connection cables. Direct contact with device plugs by laboratory users should also be reduced. Such safety management measures not only reduce equipment damage caused by user errors but also ensure user safety.

2.3.3 Laboratory Regulations

The laboratory should establish a comprehensive system of rules and regulations, prohibiting the entry of banned items, such as open flames, liquids, and food, to avoid potential hazards, such as short circuits and equipment damage. Procedures for the disposal of prohibited items should be established, and violators should be punished accordingly.

2.3.4 Regular Inspections

Regular safety inspections are crucial to detect potential hazards and take corrective actions promptly. A reasonable safety inspection system should be established to classify laboratories into high, medium, and low-risk categories based on accident severity. The safety inspection frequency should vary based on risk level, with a liability system in place to hold inspectors accountable in the event of an accident.

2.4 Property Safety Perspective

2.4.1 Kensington-style Computer Lock

To improve the security of computer equipment in business school laboratories, Kensington-style locks can be implemented. These locks consist of a steel cable attached to the equipment and locked to a fixed object, providing a physical barrier against theft and increasing the protection of laboratory equipment. (2) Establish a Property Management System

To effectively manage laboratory equipment and prevent loss, universities should establish a comprehensive laboratory property management system, including the purchase of insurance to provide necessary protection for the laboratory's property, equipment, and other items. This can help ensure that all laboratory equipment is tracked and properly maintained, and reduce the risk of loss.

2.4.2 Access Control System

To restrict access to the laboratory and improve the utilization of laboratory equipment, a secure access control system can be implemented, using an information system to collect usage data. Unauthorized personnel can be prevented from entering the laboratory, and the system can track and manage equipment usage more effectively.

2.4.3 Security and Real-time Monitoring

Lab security can be improved with networked monitoring equipment like probes and alarm systems, which can monitor personnel, equipment, and items entering and leaving the lab. Additionally, an environmental monitoring system can detect and alert lab personnel to abnormal conditions like temperature, humidity, and noise in real-time.

Conclusion

Safety management in university laboratories requires collective attention and participation from authorities, universities, and society. Domestic university business school laboratories have established safety management systems and improved facilities while regulating experimental behavior to ensure safety and reduce hazards. However, aligning with sustainable development strategies and cultivating innovative talents is also crucial. This approach promotes systematic development and establishes a long-term operational mechanism for safety management in university business school laboratories.

References

[1] Zhao WW, Li GT. Analysis of the current situation of laboratory safety in colleges and universities and research on management countermeasures [J]. Chinese Journal of Safety Science, 2003, 13(3): 27-29.

[2] Liao QM. Thinking about laboratory safety management in higher education [J]. Laboratory Research and Exploration. Laboratory Research and Exploration, 2010, 29(1): 168-170.

[3] Zhang, CQ. Laboratory safety and environmental protection in Japanese universities [J]. Laboratory Experimental Technology and Management, 2010, 27(7): 164-167.

[4] Bai GM. Reflections on the construction of innovative laboratories[J]. Experimental technology and management, 2007, 24(2): 136-138.

[5] Yu JH. A Brief Discussion on Laboratory Safety Management in Higher Education [J]. Experimental Science and Technology, 2011, 9(3) :179-181.

[6] Lin RF, Wen HL, Chen XJ. A brief discussion on the problems and countermeasures of laboratory safety

management in colleges and universities [J]. Laboratory Research and Exploration, 2011, 30(8) : 429-431.

[7] Ye BL, Wang JQ, Li WY, et al. The construction and practice of laboratory safety management system in higher education Practice [J]. Laboratory Research and Exploration, 2011, 30(8): 419-422.

[8] Lin WF. Research on the current situation of laboratory safety management in colleges and universities and its innovative countermeasures [J]. Experiment Laboratory Science, 2008 (4) : 156-158.

[9] Xu JN, Guo F. Analysis and consideration of laboratory safety management in colleges and universities in the new era [J]. China Journal of Safety Science, 2005, 15 (4) : 37-39.