

Exploration of University Laboratory Safety Education Platform Based on WeChat official account

Xuefen Zeng

School of Artificial Intelligence, Jiangnan University, Wuhan 430056, China

Abstract: As a new thing in the field of information technology, WeChat public platform has a huge impact on people's social communication life. According to the functions and advantages of the platform, this paper proposes an online and offline college laboratory safety education model based on WeChat official account, which provides a reference for effective laboratory safety education and emergency prevention ability training.

Keywords: WeChat public platform; Laboratory; Safety education.

1. Introduction

The university laboratory undertakes an important task of education, teaching and scientific research. Laboratory safety management is an important guarantee for the development of various activities in universities, and also an important place for accident prevention and control and safety management in universities. In May 2019, the Ministry of Education issued the Opinions on Strengthening the Safety of University Laboratories [1] for the safety of university laboratories, which pointed out that the weak links and outstanding contradictions in laboratory safety should be effectively solved, and put forward new requirements for strengthening the safety management ability and level of university laboratories, reflecting the Ministry of Education's high attention to the safety of university laboratories. Therefore, it is very important to strengthen the construction and safety management of university laboratories to ensure the life safety and healthy development of teachers and students.

In the last two years, the university where the author works has only strengthened the importance of laboratory safety. An experimental safety department in charge of laboratory safety has been set up separately under the Office of Academic Affairs, and a post of safety officer has been set up in each experimental center. For the time being, the safety education and training work of the center are held part-time by the experimenters, and various potential safety hazards are investigated to ensure the safety of laboratory instruments and equipment, and ensure the smooth progress of teaching and scientific research. Since the new department was established soon, many rules and regulations need to be improved.

With the rapid development of smart phones and technological innovation, almost all students in my university are using smart phones, and WeChat APP has gradually become the mainstream communication tool. Since its launch in August 2012, the WeChat public platform has gathered more than 360 million public accounts by the 10th anniversary of August 17, 2022 [2]. Its main functions include directional push of multimedia information, one-to-one interaction, diversified development and intelligent reply. WeChat public platform is a tool that includes cultural communication, interpersonal communication, lifestyle, etc. The popularization and promotion of laboratory safety knowledge through the mobile phone WeChat official account

can accurately push and realize the rapid transmission of information, which has the advantages of high popularity and simple operation.

2. Analysis of the Current Situation of Laboratory Safety Education in Colleges and Universities

Hain's Law [3] points out that any safety accident can be prevented. Any serious safety accident must be the result of multiple safety hazards. Therefore, improving safety awareness in daily laboratory safety management is an effective way to prevent major safety accidents. Among them, the popularization and strengthening of safety awareness play a vital role in laboratory safety management.

The main body consciousness of laboratory safety is lacking, and the core factor of laboratory safety lies in people. Although the school attaches great importance to laboratory safety, some teachers and students often have slack thinking and negative attitude towards safety education and safety inspection due to inadequate implementation. The important reason for laboratory safety accidents is that the relevant departments and personnel have weak safety awareness and there are always psychological flukes, believing that safety is the result of no accident. In the process of learning and practice, students lack of relevant safety guidance, and lack of scientific knowledge of laboratory safety, so they have insufficient understanding of potential dangers and safety hazards.

While the laboratory management work has been continuously promoted, we have also found some shortcomings: first, the level of the laboratory safety department is not high, the real laboratory safety management personnel are insufficient, and the comprehensive ability is limited. Second, the communication between the laboratory and teachers and students is not smooth, and there is a lack of corresponding communication channels. It is difficult for the laboratory information to reach every student in a timely and comprehensive manner, and it is also difficult for students to immediately feedback or give us advice on problems they encounter [5]. Therefore, it is necessary to establish a targeted and efficient laboratory safety education platform.

3. Application features of WeChat public website

The WeChat software itself is completely free, and no fees will be charged for using any function. The network operator will charge for the internet traffic generated during use. Moreover, the entire campus network of the university where the author works covers the campus network. As long as you log in to the campus network with your student ID, you can have unlimited traffic. So, to a certain extent, this platform is completely free. And it does not need to download the APP separately, which does not occupy the memory of the phone.

The official account is easy to log in, unlike other software platforms, which have to be registered and log in with user name and password, because the WeChat public platform is used on the basis of WeChat, and every student's WeChat is long-term online, so no additional login is needed. Just scan the QR code of the official account when using it for the first time or pay attention to the official account when recommended by students and teachers, you can be permanently online and more convenient to use.

Based on the numerous features and convenience of WeChat official account, many of them have been applied to university laboratory security. For example, the laboratory safety education examination system based on WeChat applet gives full play to the convenience and efficiency of mobile Internet [6], and provides chemical engineers with the AALTOLAB teaching laboratory safety platform of laboratory safety teaching methods [7].

4. Function realization of safety education platform

4.1. Establishment of WeChat official account security education platform

Considering the requirements of laboratory safety education, message push, user management, interactive platform, laboratory access test, etc., we built a WeChat official account safety education platform. The screenshot of the built WeChat official account platform is shown in Figure 1.



Fig. 1 Laboratory security access WeChat official account

As shown in Figure 1, the first item in the menu of the official account platform is "laboratory classification". Since the knowledge involved in laboratory safety is huge and messy, and each laboratory has its own focus, in order to reduce the burden of students and target learning, safety education is classified into different laboratories. Taking the

author's school as an example, there are chemical laboratories, biological laboratories, electrical laboratories, medical laboratories, etc. Various safety education resources, such as animation, video, pictures and text, are used to cover laboratory management rules and regulations, safety knowledge of dangerous chemicals, safety signs, fire safety videos, etc. Usually, you can also push the cases and analysis contents of safety accidents in the laboratory from time to time. The purpose is to highlight the characteristics and harmfulness of various accidents to the greatest extent through case warning analysis, so as to attract students' attention, Enhance the persuasion and appeal of laboratory safety training.

4.2. The second item in the menu of the official account platform is "knowledge difficulties", emphasizing some professional knowledge points that are easy to ignore at ordinary times.

4.3. The third item in the menu of the official account platform is "exam".

The sub menu item of the exam is also classified according to the laboratory. Users can select the corresponding sub menu according to their needs, as shown in Figure 2. The official account will push the matching two-dimensional code of the exam question, press and hold the picture to scan the two-dimensional code, and the corresponding test paper will be entered. The exam paper is realized with the help of the existing "star questionnaire" software on the network, taking the Electrical and Electronic Experiment Center as an example, This test volume assesses laboratory safety knowledge, with a total of 50 examination questions, covering experimental safety knowledge, including safe water use, safe electricity use, standardized operation of instruments and equipment, laboratory safety signs, laboratory rules and regulations, and emergency handling methods for safety accidents. In view of the strict requirements on laboratory safety, the admission test must be passed with full marks. Those who fail in this examination must take the make-up examination and can enter the laboratory only after meeting the requirements. The security knowledge test is shown in the figure.



Fig. 2 Security Test Entrance

电工电子实验室安全试题

为有效防止实验室安全事故的发生,保障师生人身和财产安全,在我院实验室学习和工作的所有人员在进入实验室开展实验之前,必须参加实验室安全准入培训考核,合格者(100分)方可进入实验室开展实验活动。未取得准入资格的人员进入实验室开展实验,一经查实,学院将追究实验室相关人员的责任。

*** 基本信息:**

班级:

学号:

姓名:

*** 1. 电源插座、接线板、电线的容量应满足电器功率的需要。**

☐ A 正确

☐ B 错误

*** 2. 对于触电事故,应立即切断电源或用有绝缘性能的木棍棒挑开和隔绝电流,如果触电者的衣服干燥,又没有紧缠住身上,可以用一只手抓住他的衣服,拉离带电体;但救护人不得接触触电者的皮肤,也不能抓他的鞋。**

☐ A 正确

☐ B 错误

*** 3. 实验室内应使用空气开关并配备必要的漏电保护器;电气设备应配备足够的用电负荷和电键,不得超负荷用电;电气设**

下一页

Fig. 3 Safety test questions of electrical and electronic laboratory

The background of the official account can edit and sort out various learning contents and information notices into materials in advance, such as fire safety knowledge series, which can be sent irregularly, so that the operation is flexible and timely. This kind of irregular learning mode enables students to constantly master laboratory safety knowledge, gradually strengthen safety awareness and firmly master safety protection skills in a subtle and constant learning atmosphere.

4.4. Interact with users. Students can leave messages about an article, forming a small discussion platform.

In addition, the platform has the keyword reply function. The background presets keywords. When users reply to the corresponding keywords on the public platform, the platform will trigger the corresponding reply to query these materials in this way. With the help of the platform, we can timely understand students' learning situation and solve the problems and puzzles that students encounter.

A student safety education platform is built through WeChat official account, which can implement message push for precise users and provide an efficient and convenient student laboratory safety promotion platform. The experimental safety education promotion platform still has many functions to be improved, which requires the safety officer to continue to enrich the construction content of the platform and make efforts for the long-term development of experimental safety education.

5. Conclusion

The laboratory safety education model based on WeChat official account platform, which combines online and offline, has opened up a new concept for laboratory safety promotion. The platform has narrowed the distance between the laboratory and teachers and students, made up for the shortcomings of the traditional laboratory safety education model, realized online theoretical learning, practice, examination, consultation and Q&A and other functions, enriched experimental teaching resources, and strengthened the interaction of experimental teaching information. Continuous circulation and resource sharing. Moreover, the operation is simple and convenient, so that students can learn without the limitation of time and space. It provides an efficient and flexible tool for laboratory safety education, greatly improves the working efficiency of laboratory safety in colleges and universities, realizes the dynamic management of safety education, effectively reduces the potential safety hazards of human factors in the experiment process, and provides a reference for the effective development of laboratory safety education and emergency prevention ability training.

References

- [1] Ministry of Education. Opinions of the Ministry of Education on strengthening the safety of university laboratories: Jiao Ji Han [2019] No. 36 [EB/OL]. (2019-05-24) [2021-08-15].
http://www.moe.gov.cn/srcsite/A16/s3336/201905/t20190531_383962.html.
- [2] <https://view.inews.qq.com/wxn/20220817A06C6K00?qq=670433900>.
- [3] [https://baike.baidu.com/item/Hain's Law/2115167? fr=aladdin](https://baike.baidu.com/item/Hain's%20Law/2115167?fr=aladdin).
- [4] Tan Xiaoping, Shi Lin University Education [J] December. 2021.190-192.
- [5] Lai Rong, exploration and practice of strengthening the management of basic chemistry laboratory by using WeChat public platform [J] University Chemistry (Daxue Huaxue). Univ. Chem.2017, 32 (3), 43-48.
- [6] Lin Xiantu. Research on Laboratory Safety Education System Based on WeChat Applets [J] Journal of Jilin University (Information Science Edition), 2021, 39 (2): 223-228.
- [7] Panu (1); Learning experiences from digital laboratory safety training. Education for Chemical Engineers, Issue date: January 2021, Pages: 87-93.