Development of elements of clothing laboratory management in Shaanxi Fashion Engineering University

Li Jiao, Soisuda Lohmood[*], Supaporn Khangkham

Program in Technology and Innovation Management, Graduate School,
Bansomdejchaopraya Rajabhat University
1061 Soi Itsaraphap 15, Hiranruchi, Thonburi, Bangkok 10600
*Tel. 0860101100 E-mail: soisuda.lo@bsru.ac.th

Abstract

This study aims to explore in-depth the management needs of the clothing laboratory at Shaanxi Fashion Engineering University. To achieve this, we designed and conducted a questionnaire survey involving 282 clothing major students and 78 teachers from the Fashion Institute. After completing data collection, we applied rigorous procedures to process and analyze the data. Statistical methods, including calculating the mean and standard deviation, were used to quantitatively analyze the survey data and ensure accurate and objective conclusions. And review by 6 experts.

The study identified eight key elements: 1) laboratory equipment management, 2) data and document management, 3) laboratory access management, 4) consumables management, 5) environment management, 6) personnel management, 7) safety management, and 8) system management. These eight elements comprehensively cover the management and optimization of clothing laboratories in higher education institutions. From the intelligent management of equipment, data, and documents to the precise control of laboratory access, consumables, and environment, as well as personnel training and incentives, the enhancement of safety protocols, and the continuous improvement of management systems, these aspects collectively promote the development of laboratories toward greater efficiency, safety, and environmental sustainability.

Keywords: Clothing laboratory, laboratory management

1. Introduction

According to the 2019 National Education Development Statistical Bulletin, the gross enrollment rate of higher education in China exceeded 50% in 2019, with a total of 40.02 million students enrolled, and higher education entered the stage of popularization. (National Bureau of Statistics, 2020). The "Modernization of Education in China 2035" proposes to promote high-quality development of education. However, about 150 electrical safety accidents occur in Chinese universities every year, highlighting the importance of strengthening laboratory management and improving information technology levels. (Central Committee of the Communist Party of China and the State Council, 2019). Universities should prioritize strengthening laboratory management, improving information technology, and implementing standardized management methods to ensure the safety of teachers and students and the normal operation of laboratories, thereby creating a safe, practical, and innovative learning environment for students. General Office of the Ministry of Education, 2022). The Action Plan for Education Informatization 2.0 points out that the level of informatization in universities is not high and requires deep integration of information technology and teaching management. (Ministry of Education, 2018). This study focuses on the current management status of the clothing laboratory at Shaanxi Fashion Engineering University, and identifies issues such as inaccurate statistics and non-standard management. Optimization plans are proposed to improve management efficiency and teaching quality, contributing to the development of the university.

2. Purpose
Major Objective

Development of elements of clothing laboratory management in Shaanxi Fashion Engineering University.

Specific Objectives

2.1 To study the demand of clothing laboratory management in Shaanxi Fashion Engineering University.

2.2 To define and evaluate the elements of clothing laboratory management in Shaanxi Fashion Engineering University.
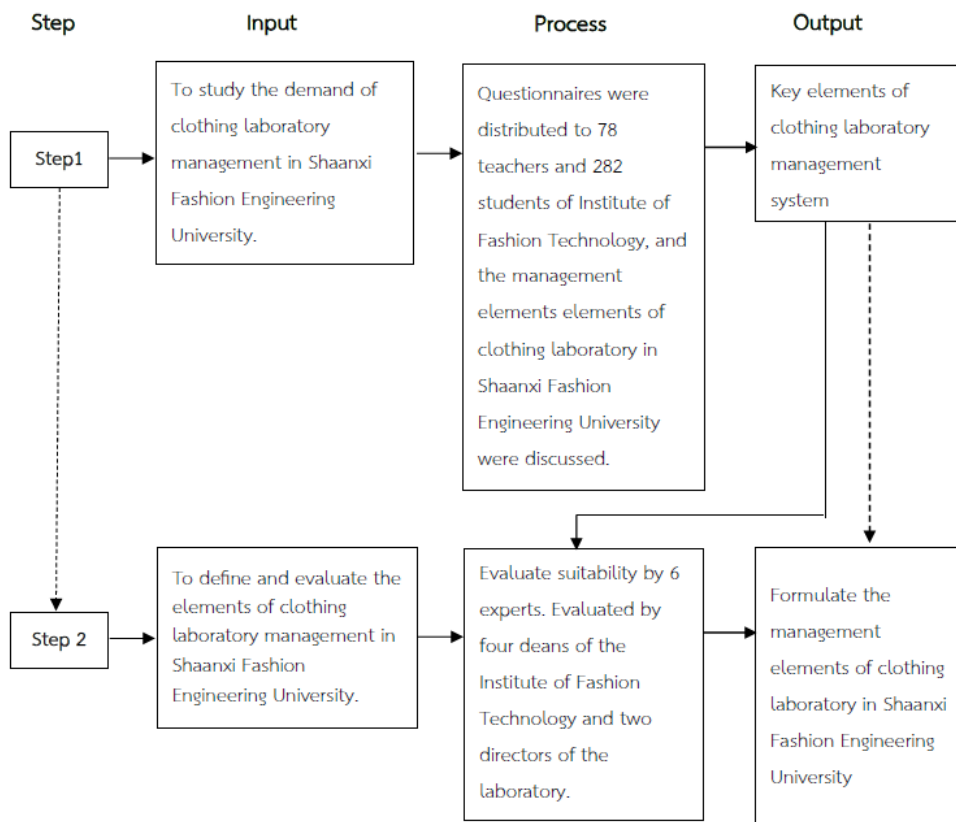
3. Research regulations

This study aims to analyze the existing problems in the management of the clothing laboratory of Shaanxi Fashion Engineering University, such as data statistical errors, randomness in daily management, and omissions in experimental teaching cooperation. Through a combination of theory and empirical methods, proposes to build a scientific, standardized, and efficient management system solutions and invite industry experts for evaluation.

4. Research methods

The whole research process 2 steps of the research process can be summarized as Figure 1

Figure 1 Research process

4.1 To study the management elements of clothing laboratory in Shaanxi Fashion Engineering University.

4.1.1 Define the population and sample.

All teachers and students of the School of Shaanxi Fashion Engineering University, the dean of the Fashion Institute, and the director of the laboratory of the Fashion Institute. It includes 960 students, 78 teachers, six deans, and two laboratory directors.

The sample group includes 78 teachers and 282 students from the Fashion College of Shaanxi Fashion Engineering University.

4.1.2 Research Instruments

The tool used in this study is a questionnaire, and its creation process includes: 1) Study clothing laboratory management literature. 2) Construct a theoretical framework for the elements of the clothing

laboratory management system. 3) Design a questionnaire based on the theoretical framework and extract critical data and information.

4.1.3 Data collection

1) Survey according to the methods and principles of the questionnaire.

2) Summarize and analyze the results of 360 questionnaires and conduct statistical analysis and research on the critical elements of the laboratory management system of Shaanxi Fashion Engineering University.

4. 2 To evaluate the management elements of the clothing laboratory in Shaanxi Fashion Engineering University.

4.2.1 Define the population and sample

The sample group consisted of 6 laboratory management experts.

4.2.2 Research Instruments

The tool used in this research is evaluation forms.

4.2.3 Data collection

1) Distribute evaluation forms to give scores to experts.

2) Collect basic information from experts, such as gender, age, education level, etc.

3) Experts evaluate the consistency of laboratory management elements of clothing.

4) Express your opinions in the " Suggestions and Reasons" column.

5. Study results

The School of Fashion Engineering at Shaanxi University of Fashion Technology has a total of 960 students and 78 teachers. To study laboratory management, a questionnaire survey was conducted on 282 students and 78 teachers in the college, and the mean and standard deviation of the data were analyzed. The results are as follows.

Table 1 Results of define the demand of elements of clothing laboratory management in Shaanxi Fashion Engineering University.

The results of data analysis of the demand of clothing laboratory management in Shaanxi Fashion Engineering University, laboratory equipment management	Mean	S.D.
1. Laboratory equipment	4.31	0.84
2. Data and document	4.25	0.87
3. Laboratory open	3.92	1.09
4. Laboratory consumables	4.24	0.84
5. Laboratory environment	4.23	0.89
6. Laboratory management personnel	4.37	0.79
7. Laboratory safety	4.31	0.86
8. Laboratory management	4.32	0.82

Based on the results of the questionnaire survey, six clothing experts were invited to evaluate the consistency of the management improvement factors in the clothing laboratory at Shaanxi Institute of Fashion Engineering. The median (MED) and interquartile range (IQR) for each item were then calculated.

Expert evaluation of the equipment management elements of the clothing laboratory at Shaanxi Fashion Engineering University 1) Laboratory equipment management 2) Data and document management 3) Laboratory open management 4) Laboratory consumables management 5) Laboratory management personnel management 6) Laboratory safety management 7) Laboratory environment management and 8) Laboratory management system

To sum up, it can be concluded that all elements of the clothing laboratory management system of Shaanxi Institute of Fashion Engineering have been highly recognized and demanded by experts, and the experts have reached a high degree of agreement on the demand for these element.

6. Summary of study results

Table 17 The elements of clothing laboratory management of the new item

Revision of Elements of Garment Laboratory Management	
Original Item	New Item
1. The laboratory managers and users will complete the laboratory safety log on time.	The contents of the laboratory security log can be reflected in other logs and, therefore, can be cancelled.
2. fill in the loan registration form by the regulations when borrowing laboratory items.	Simplify the borrowing process
3. the laboratory appointment method be an offline appointment	Use the WeChat mini program or official account to make an appointment
4 cancel your lab appointment	Simplify the lab appointment approval process

Based on the analysis in Table 17, expert insights are adopted to optimize the management elements of the clothing laboratory. Four aspects need to be adjusted: cancelling security logs, simplifying borrowing, WeChat applet reservations, and optimizing the reservation process.

7. Discuss the results

Many scholars agree that laboratory equipment, data and documents, consumables, environment, personnel and safety management are crucial in clothing laboratory management and play a significant role in improving learning efficiency, scientific research level and ensuring safety. They emphasized the importance of optimizing management processes and improving efficiency and advocated open management to promote academic exchanges and industry- university- research cooperation. At the same time, with the development of science and technology,laboratory management systems need to be constantly innovated to adapt to new needs.

8. Suggestions

Through this study, the following recommendations are made:

1. Consider eliminating the mandatory requirement to fill in separate laboratory safety logs, as other log systems can reflect the content to reduce workload and optimize processes.

2. Simplify the laboratory item borrowing process to ensure speed and efficiency and optimize resource allocation.

3. Promote using WeChat mini programs or public accounts to make laboratory appointments to improve convenience and efficiency.

4. Optimize the laboratory appointment approval process, reduce administrative links, reduce burdens, and improve efficiency. It is not recommended that you cancel the reservation function directly.

9. Acknowledgments

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