Intelligent Management of Public Computer Labs in Colleges and Universities under the Artificial Intelligence Environment — Taking Wuyi University as an Example

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Abstract: ***With the rapid development of artificial intelligence technology, the management mode of public computer labs in colleges and universities is gradually transforming towards intelligence and high efficiency. This paper realizes identity authentication and permission management by introducing an intelligent access control system, improves resource utilization by deploying multiple systems in parallel, ensures data security by combining hard disk restoration and protection technology, and establishes a post responsibility system to clarify management responsibilities. At the same time, it improves students' professional level by cultivating a student management team and regularly conducts safety emergency drills to enhance the security and stability of the computer labs. Practice has proved that this intelligent management solution can effectively improve the management efficiency of computer labs, reduce operation and maintenance costs, and enhance the reliability and security of the system. This research provides a feasible practical path for the intelligent management of public computer labs in colleges and universities, and has positive significance for promoting the construction of educational informatization.***

Keywords: Artificial Intelligence; Applied Colleges and Universities; Public Computer Labs; Intelligent Management.

1. INTRODUCTION

In applied universities, the public computer labs are not only the core teaching venues for public computer courses and specialized courses, but also shoulder the important functions of students' professional experiments, internships, and various internal and external examinations and trainings. They are the key platforms for practical teaching and skill cultivation. Their management level, maintenance status, and security guarantee are directly related to the teaching order, scientific research progress, and the information security of teachers and students According to the above needs, this paper will take Wuyi University as an example to establish a sound computer lab management system based on the artificial intelligence environment, do a good job in daily maintenance, and strengthen safety protection measures.

2. CURRENT SITUATION AND EXISTING PROBLEMS OF COMPUTER PUBLIC COMPUTER ROOMS

2.1 Current Situation

Currently, there are 20 public computer rooms and over 2,000 computers in the public computer rooms and computer teaching experiment centers of Wuyi University, which undertake the teaching tasks of public courses and some professional courses for the whole school. The annual average usage exceeds 500,000 person-hours. Coupled with taking various exams inside and outside the school on weekends, such a high usage rate brings certain difficulties to the maintenance work.

2.2 Existing Problems

2.2.1 Hardware and Equipment Management Issues

Today, with the rapid development of information technology, computer technology is being updated at an astonishing speed. There are many computer teaching experiment center rooms in Wuyi University. Calculated at the rate of updating two rooms every year, it will take 10 years to complete all hardware upgrades. Its outdated configuration is difficult to support the operation requirements of modern teaching software, resulting in low

overall operation efficiency. In addition, these old devices often come with problems such as unstable power supply, poor heat dissipation performance, and poor compatibility of external devices. Newly purchased computer equipment faces hardware compatibility challenges, mainly manifested as driver conflicts between components, operating system adaptability problems, and software operation environment incompatibility. The early deployed network infrastructure (including core switches, routing equipment, and physical transmission media, etc.) has seriously aged, the network throughput has decreased significantly, and the overall transmission performance can no longer meet the existing requirements.

2.2.2 Software and Resource Management Issues

The following problems exist in the operation and maintenance management of the public computer rooms in Wuyi University: 1) In terms of software management, there are problems such as lagging version iteration, difficulties in cross-platform adaptation, lack of deployment specifications, and delayed vulnerability repair; 2) In terms of resource management, there are problems such as system load imbalance, incomplete uninstallation and cleaning, and complexity in multi-system coordination.

In recent years, the contradiction between backward equipment and software upgrade requirements has gradually increased. Some computer hardware has been in service for more than ten years, while the course software versions are still constantly updated. The existing computer equipment in Wuyi University has problems with lagging system versions, specifically manifested as the stock terminals still running the Windows 7 operating system, while the current teaching software generally requires a Windows 10 operating environment, which has led to a double contradiction of software compatibility obstacles caused by system generation differences and system upgrade dilemmas restricted by insufficient hardware configuration.

The public computer rooms in Wuyi University also face the following challenges in software management: 1) Mixed installation of cross-disciplinary software leads to insufficient system resources; 2) High-frequency external network access increases the risk of virus intrusion; 3) Residues after software updates; 4) The system environment is single, and the configuration cannot balance the different needs of teaching and examinations.

2.2.3 Environmental and security issues

Currently, the construction of the public computer rooms at Wuyi University dates back a long time, and neither the layout nor the decoration style can meet the needs of modern teaching. However, a full renovation of all the computer rooms will result in high maintenance costs. The improper use of some students has led to an increased risk of equipment failure, such as food residues getting into the equipment and littering, which poses a hidden danger to equipment maintenance. Despite the teachers' repeated emphasis on maintaining environmental hygiene, there are still students who lack self-awareness and casually discard garbage. As a densely populated place, the aging wires and overheated equipment in the public computer rooms pose significant safety hazards. Document also points out that the aging of the lines and the high-load operation of the equipment are one of the main causes of computer room fires.

2.3 Relative Works

Meng (2023) established a foundation in industrial applications by developing a neural network-based evaluation system for green cable cabling [1], while Junxi et al. (2024) advanced recommendation systems through a graph convolutional network model that leverages matrix factorization [2]. Concurrently, Hu et al. (2024) explored new architectures in deep learning for text sentiment analysis using multiscale deep neural networks [3], and Shen et al. (2025) applied the whale optimization algorithm specifically to enhance financial payment fraud detection [4]. In a parallel effort to improve model efficiency, Shi et al. (2026) focused on synthetic data generation to fine-tune large language models for telecommunications [5], whereas Choudhury et al. (2025) addressed the crucial aspect of sustainability and trustworthiness in AI through energy-efficient regularization techniques [6]. Further expanding the application scope, Gao (2026) proposed an intelligent control system for industrial electrical enterprises aligned with ISO standards [7], and Li (2024) emphasized user-centric design in intelligent e-commerce platforms [8]. The challenge of misinformation was tackled by Yuan et al. (2025), who developed a mixture-of-experts network for multi-modal fake news detection [9], while Jiang et al. (2025) strengthened IoT security with a unifying framework that combines multi-expert attention and hard contrastive learning [10]. To optimize business intelligence, Tian et al. (2025) introduced a cross-attention multi-task learning approach for digital advertising ad recall [11], and Shen et al. (2026) integrated graph convolutional networks with multi-omics data to predict

survival risk in colorectal cancer patients [12]. The intersection of financial and predictive modeling was explored by Zhang (2026), who proposed a hybrid LSTM-GARCH model incorporating volatility factors from US markets [13], whereas Jie (2024) demonstrated the practical utility of AI in industrial defect detection [14]. Reiterating the importance of business intelligence in advertising, Tian et al. (2025) again confirmed the efficacy of their cross-attention multi-task learning framework [15]. Finally, Song et al. (2025) and Gao et al. (2025) extended the frontier to cross-modal learning and system diagnostics, with Song et al. (2025) proposing a natural-to-medical CLIP framework with dual semantic missing contrastive learning [16], and Gao et al. (2025) developing a hierarchical reasoning and LoRa-enhanced framework for root cause analysis in distributed systems [17].

3. OPTIMIZATION STRATEGIES AND PRACTICES FOR THE OPERATION AND MAINTENANCE MANAGEMENT OF COMPUTER PUBLIC CLASSROOMS

Based on the main challenges faced by current computer public classrooms in aspects such as hardware device management, software system maintenance, physical environment security, and daily operation and maintenance, administrators have taken a series of measures to improve the efficiency of daily work.

3.1 Intelligent Access Control System

From the access control system to the Internet of Things platform, various intelligent technologies lay the foundation for the intelligent operation and maintenance of computer rooms. Therefore, Wuyi University first upgraded its access control system. The access control of the public computer rooms in Wuyi University is linked to the course schedule of the educational administration system, enabling real-time synchronization of course information. The access control in this university is also equipped with a mobile app, which can view the course schedule of each computer room and can open the door remotely. When there is a temporary schedule change, the management staff can remotely operate the access control via the mobile application to handle temporary changes or emergencies. The access control is also equipped with dynamic permission control, and time-limited permissions can be set for those who want to enter or exit temporarily (such as maintenance staff).

3.2 Parallel Deployment of Multiple Systems

In view of the situation of numerous course schedules and diverse course types in the public computer rooms of Wuyi University, combined with various examinations on weekends, if only one operating system is installed on the computers in the school, it will lead to system overload and a decline in equipment performance. The administrator will deploy multiple operating systems on the computers, such as the basic teaching system, the professional teaching system, and the examination system, etc. For professional software that needs to be activated separately, such as 3ds Max and Maya, the administrator deploys it in the professional teaching system so that it can be activated one by one after the system synchronization is completed. Due to the large number of classrooms, systems, and different service specialties, the administrator makes a software list for each computer room and posts it beside the teacher's computer to facilitate teachers and students to understand the systems they should use. The software list is shown in Figure 1. For example, System 1 is the basic teaching system, mainly used for public courses such as English and computer basics; Systems 2-4 are professional teaching systems, which install professional software according to the needs of different departments to adapt to the corresponding courses; System 5 is Win10, used to accommodate software that cannot run on Win7 to ensure the normal use of teaching software. For different examinations such as the National Computer Rank Examination, the Bank ATA Examination, and the Judicial Examination, corresponding systems and software are configured separately. When taking an exam, the corresponding system is called and hidden after the exam for subsequent repeated use, improving management efficiency.

Table 1: Software List

Software List of the Computer Teaching Experiment Center Laboratory			
Classroom: Ruizhang 6-404			
Serial Number	System Name	Installation Program	
1	win7- 1 64-bit	Flash CS6 Office2010 python (College Computer II) Rational rose 2007 English available DingTalk software	
2	win7- 2 64-bit	Adobe After Effect (AE) Adobe Premiere Pro(PR CC 2017) AutoCAD 2010 Coredraw 12 Dreamweaver CS6 Flash CS5.5 Lumion logisim/vivado (Computer Organization and Architecture) Photoshop C56 Rhino (Original Cow)	sketch up WPS 3D max
3	win7- 3 32-bit	Adobe audition CS5.5 Office 2016 VB VC Kingsoft Typing	Xusheng Video Editor

4	win7- 4 64-bit	Eclipse eviews 10 java Lingo 13 matlab 2016a office2010 python (Anaconda3) spasa 22	SPSSModeler18 tomcat 8 VS2013+SQL2013 VPC
5	win10	AB 2023SP DevC++ WPS	
IP: 192.168.40.81-192.168.40.150 Subnet Mask: 255.255.252.0 Gateway: 192.168.40.1			Channel Number: 32

3.3 Hard Disk Restore Protection

The public computer rooms of Wuyi University use the Lenovo hard disk protection system. As shown in Figure 2, this interface displays the main options and policy configuration interface of the hard disk restore protection. This protection system provides the following management functions: 1) System hiding and startup settings, which can hide the specified operating system and support setting the default startup system; 2) Partition restore policy configuration, including three settings: automatic restoration at each startup, regular restoration monthly, and maintaining the current state without restoration. To meet the class requirements, the administrator sets it to automatically restore at each startup. This solution, by solidifying the software environment configuration, not only improves the system reliability but also strictly restricts unauthorized changes to the environment by users. This solution also effectively avoids the damage to the system caused by users' random installation of software or virus infection.

3.4 Post Responsibility System

The computer room management system of Wuyi University has been continuously improved, and the implementation of responsibilities is ensured through institutional means. The responsibilities of administrators are refined, and a corresponding person in charge is assigned to each computer room. When a fault occurs in the computer room, the management and maintenance personnel need to keep maintenance records to ensure clear powers and responsibilities [9]. The administrator team has a clear division of labor and each person is responsible for their own work, such as equipment maintenance, safety management, and daily inspections of the computer rooms they are in charge of. Some specific tasks are further subdivided. For example, the asset management specialist is responsible for the full life cycle management of equipment, including the registration of new equipment into the warehouse, the scrapping of old equipment, the transfer of assets between departments, and the management of fixed asset accounts. The administrative coordination and safety administrator is responsible for connecting with the school's administrative affairs, including timely conveying various notices and tasks, organizing safety inspections and hidden danger investigations, and summarizing and reporting the operation data of the laboratory. The teaching scheduling specialist coordinates the teaching resources of the computer room, including course arrangements and temporary class schedule adjustments, the coordinated optimization of computer room usage, and the annual machine time statistics and analysis.

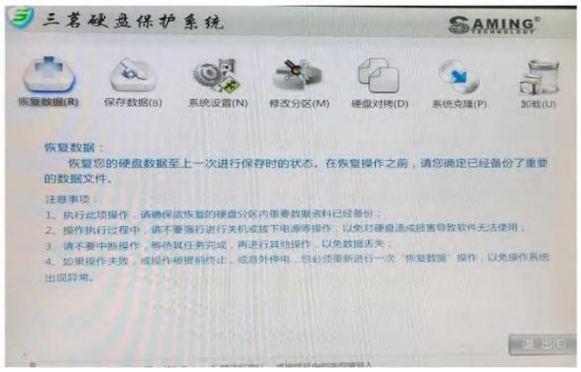

Figure 2: Hard disk protection system

3.5 Cultivation of the Student Management Team

The team of college student computer room administrators is an important supporting force for ensuring the school's information-based teaching, research, and daily management. With the advancement of the construction of smart campuses and the transformation of education digitization, computer room administrators need to possess stronger technical capabilities, service awareness, and security management levels. Wuyi University has set up part-time job positions in its public computer rooms, selected students to serve as computer room administrators, and trained them in three echelons, forming a "mentoring" mechanism. 1) Sophomore students serve as the core executive layer and undertake the main practical work under the guidance of teachers; 2) Freshman students are the probationary echelon and learn from sophomore seniors through the "mentoring by the old" method; 3) Junior

students serve as the technical guidance layer and are responsible for providing professional tutoring and technical support to sophomore students. After training, the computer room administrators in this school have made remarkable improvements in computer hardware maintenance, installation of common operating systems, software deployment and debugging, network fault diagnosis, basic network security, and IT service communication.

3.6 Safety Emergency Drills

Safety emergency drills in college computer rooms are important measures to ensure the safety of computer room equipment, data, and personnel, and can effectively prevent and respond to sudden safety accidents (such as fires, cyberattacks, power failures, etc.) [11]. Wuyi University regularly organizes fire emergency drills. Through the drills, the feasibility and effectiveness of existing emergency plans can be tested, the quick response and collaborative handling capabilities of administrators, teachers, and students to emergencies can be enhanced, and at the same time, loopholes in the computer room safety management can be discovered and rectified in a timely manner. In addition to fire emergency drills, some other safety drills are also carried out regularly. For example: 1) Cyberattack emergency drills, simulating scenarios such as hacker attacks and virus invasions to test the network security protection and emergency handling capabilities; 2) Power interruption emergency drills, simulating sudden power outages and rehearsing the UPS power supply switching and emergency power supply processes for important equipment; 3) Equipment failure emergency drills, simulating server/teaching equipment failures to train the ability of rapid diagnosis and activation of backup systems. A detailed plan is formulated before the drills, and a review and evaluation are carried out after the drills to ensure that the drills meet the expectations and continuously improve the safety mechanism.

4. CONCLUSION

As an important infrastructure for modern education, the public computer labs in colleges and universities are not only the practice bases for cultivating innovative talents but also the important supports for carrying out practical teaching. Under the background of educational modernization and rapid technological iteration, the planning, construction, operation, and management of labs need to achieve the transformation of management mechanisms, the expansion of service functions, and the upgrading of development concepts [12]. In the future construction of public computer labs, it is necessary to further strengthen the concept of "student-centered and practice teaching-oriented", improve management efficiency through digital means, stimulate innovation vitality through the integration of industry and education, and lead sustainable development through green and low-carbon practices.

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