

# Application case of the combination of campus interior design and smart home in the post-epidemic era

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**Abstract.** In the post epidemic era, as a densely populated public place, schools not only have a greater risk of epidemic transmission, but also become a key area for epidemic prevention and control. In general, although the current primary and secondary schools and even university campuses continue to improve the level of hardware and software, campus interior design also presents a modern and scientific development trend, but with the normalization and severity of epidemic prevention and control situation, the research on intelligent furniture in the educational space has become particularly important.

**Keywords:** Intelligent Furniture; Educational Space; Post-epidemic Era.

## 1. Introduction

### 1.1 Background of the Study

Campus is an important place for students to learn knowledge, expand their horizons, and realize the goal of China's current education. It contains the aesthetic requirements of teachers and students for the study and work environment, and also becomes an important window and channel for schools to display campus culture.[1] Meanwhile, as the epidemic prevention and control of the normalization of the situation and the development of severe, campus is the focus of the epidemic, the outbreak of campus security management and the normal operation of the campus has received extensive attention of the society, also led to the change of the interior design of campus, the article through the analysis of the outbreak era campus interior design, To explore the application of smart home in campus interior design and the reform direction of campus interior design.

### 1.2 Research content and purpose

In this paper, the combination of campus interior design and smart home in the post-epidemic era is the main research content. Through the investigation and effect evaluation of current campus interior design problems, combined with the specific application cases of campus interior design and smart home, new ideas and ideas for campus interior design reform in the new era are provided. To provide theoretical suggestions and suggestions for building a solid campus security line in the post-epidemic era and dealing with the clustering of epidemic situations on campus.

Based on epidemic prevention and control under the background of improving indoor campus planning and design as the main research objective, through the campus interior design scientific, precise, intelligent, etc., to better cope with the impact on the campus is an important place, to better safeguard the normal order of learning between teachers and students and classroom order and promote the construction of a new era campus environment safety, wisdom and sharing.

## 2. Research and analysis of campus interior design and smart home in the post-epidemic era

### 2.1 Campus interior design issues in the post-epidemic era

Since 2022, the epidemic situation in China has shown a trend of multi-point distribution. The epidemic prevention and control situation is unprecedentedly severe, and the cluster of epidemic cases frequently occurs in many places, which not only seriously affects the teaching order and teaching schedule, but also harms the physical and mental health of teachers and students. It also highlights

the problems existing in campus interior design, especially in the post-epidemic era. On the one hand, most of China's primary and secondary schools and even universities construction of intensive, personnel density is bigger, most of the occupancy rate is high, the classroom have a class time is long, low air flow, mass outbreak occurs on campus school segregation is difficult, and the air flow is relatively poor, breathe easily exist safe hidden trouble, and will accelerate the epidemic spreading in the campus, It may accelerate the spread of the epidemic on campus, and increase the risk of the spread of the epidemic on campus. As a functional building, the classroom has its design principles and key points, but how to promote the integration of classroom architecture and epidemic prevention and control is the focus of the current campus interior design. [2] Lack of separate observation, on the other hand, most of the present campus isolation room, once appear, the student individual hot catch a cold, can't do it fast and efficient isolation, and students in the classroom desks spacing is small, can't better satisfy the requirement of the epidemic prevention and control under the condition of health, these are all highlights the serious problem of the interior design of campus outbreak era. Moreover, most schools now use central air conditioning for cooling and heating, which improves students' learning conditions, but increases the hidden danger of epidemic transmission, and also leads to the wide spread of influenza in the campus during key periods such as winter and spring. The most important point is that most of the campuses, especially the classrooms, adopt relatively simple cleaning methods. Although the classrooms and campus environment are regularly disinfected, the campus environment cannot be thoroughly cleaned in time and efficiently, which also increases the transmission risk of the epidemic on campus to a certain extent.

Throughout, the present primary and secondary schools and even the university campus are constantly improve the level of hardware and software, the campus also presents a modern interior design, scientific development trend, but with the epidemic situation of normal and serious, campus interior design also exposed many problems, increase the certain security hidden danger, the future demand for campus interior designers should pay highly attention to the epidemic prevention, With the help of intelligent household, the campus interior design should better meet the needs of epidemic prevention and control, and better protect the physical and mental health of teachers and students.

## 2.2 Research and design methods

In order to understand the current epidemic prevention and control under the background of the problems existing in the campus of interior design, this article USES the literature research, questionnaire survey method, statistical analysis and other research design method, including literature research in recent years the campus interior design related literature collecting and combing, and to summarize the epidemic prevention and control on campus, The reform direction of campus interior design and the application of intelligent home under the background of epidemic prevention and control were analyzed. The questionnaire method mainly refers to collecting the existing problems of campus interior design, combining the application of intelligent home in it, organizing and forming the questionnaire, and focusing on the campus interior designers, campus administrators, educators and other groups to distribute the questionnaire, so as to obtain the relevant research data more accurately. The law of statistical analysis is mainly to carry out statistical analysis on the data obtained from the investigation and research, and then draw relevant research conclusions.

## 2.3 Summary of this chapter

Although the current campus interior design tends to be modernized, scientific, intelligent and comfortable, it still cannot better meet the needs of the normal epidemic prevention and control, especially the recent outbreak of campus epidemic in many places, which challenges the modern campus management and teaching order. For the reform of campus interior design, the epidemic is both a crisis and a challenge. Both campus interior design practitioners and campus leaders and managers should comply with the needs of epidemic prevention and control, help to build a safer, more efficient and more scientific campus environment, and ensure the normal needs of students in class.

### **3. Campus interior design in the post-epidemic era**

#### **3.1 Indoor environment characteristics**

The classroom is an important place for students to learn and teachers to teach. It not only bears the important task of teaching and educating people, but also contains the aesthetic needs of students and classrooms. It is also the main space for students' activities after class. From this point of view, the indoor environment of campus is different from the indoor environment of other buildings, and its characteristics are as follows: first, function. In order to let the classroom really play an important role in teaching, we must give it a certain function, must be the blackboard, platform, projector and other design, but also for desks, learning garden and even duty schedule to reserve a certain space, but also equipped with air conditioning, lamps and lanterns, so as to protect the students' learning environment comfort. [3] The second is aggregation. From the survey situation, most of the classrooms have a high student accommodation rate, and the spacing between students' desks is also relatively small. Campus interior designers should fully consider this factor and add the spacing between college students' desks in the design process as much as possible, so as to ensure air circulation and learning space. The third is color. In the design process, the classroom has certain requirements for color, generally to use light and bright color, while taking into account the needs of students' eyesight and brightness, and pay attention to the classroom walls of regular painting and cleaning, to create a comfortable and bright learning environment for students; [4] Although doors and Windows are the basic elements of campus interior design, in order to create a quiet learning environment for students as far as possible, most of the doors and Windows of most classrooms are closed most of the time, the indoor environment is relatively closed, which is not conducive to air circulation and also increases the risk of disease transmission.

#### **3.2 The needs of indoor environment on campus**

Through the above analysis, it can be known that the campus indoor environment presents features such as functionality, clustering, color, and closure. At the same time, the classroom is generally accommodated by young people, who have relatively high requirements for environment, color, health, etc., which also strengthens the needs of campus indoor environment to a certain extent. One is lightness. Bright indoor environment can give students a more happy mood, improve classroom learning interest and learning efficiency, at the same time can protect students' eyesight, reduce the risk of myopia, so the design process has a high requirement for indoor brightness. The second is space. Although the functional sex of the classroom is stronger, need more equipped with hardware and software, and more students in one class, but it is undeniable that students in the learning process needs certain space, not only help them form the habit of independent thinking, because too close, also can avoid the damage to body growth, at the same time reduce the risk of disease transmission. The third is hygiene. In the process of epidemic prevention and control, the importance of hygiene has been highlighted, especially in campuses with high clustering and large number of young people. Campus hygiene should be placed in a crucial position, and classrooms and campuses should be cleaned and disinfected regularly, so as to ensure the health of students and teachers and ensure normal teaching order. Fourth, aesthetics. As the main learning place, students in the classroom for a relatively long time, easy to produce aesthetic fatigue, and even give up learning enthusiasm, so in the design process should take into account aesthetic needs, actively create a humanistic environment conducive to learning.

#### **3.3 Influence of indoor and outdoor environment on campus interior design**

Although the campus interior design has many characteristics and high demand, it should be noted that the campus interior does not exist alone. Secondly, it relies on the whole "campus", so the overall environment of the campus has a greater impact on the indoor environment of the campus. On the one hand, the cleanliness of the campus environment should be ensured. If the overall cleaning design of the campus is in place and the hygiene is maintained in place, the hygiene in the classroom is also

relatively easy to maintain. On the other hand, the height and spacing of the whole campus buildings should be taken into account, so as to ensure enough sunlight and brightness, which is conducive to students' daily study. Moreover, the aesthetic consistency of the overall design of the campus should be guaranteed, and a more positive campus culture should be created, so as to provide places for cultivating students' aesthetic concepts and levels. In addition, a more systematic emergency isolation place should be constructed, especially in the context of high epidemic incidence, to establish isolation rooms and fever observation rooms to better ensure teaching order and teaching efficiency.

### 3.4 Trends of indoor environment

In recent years, with the implementation of the "double reduction" policy and the continuation of the pandemic, interior design, especially campus interior design, has undergone significant changes. First, based on the design concept of "borderless learning", the classroom design is more functional and relatively spacious, which to some extent breaks the closed classroom state with high clustering in the past. However, this design has high requirements on campus area, so it has not been widely promoted. The second is the design concept of "meeting students' diverse learning", which divides the indoor environment into spatial levels, so that students can learn together in an open space, but also have a space to think independently away from noise. This design is widely used in kindergartens and elementary schools, and can meet the learning needs of students in this section. The third is to "enhance the comfort of campus life" as the design concept, the pursuit of indoor environment in the visual, auditory, color collocation and other aspects of comfort and harmony, and noise processing, temperature control and so on have certain requirements. Fourth, the principle of emergency. The indoor environment is required to be better able to cope with natural disasters such as rainstorms and earthquakes, as well as emergency situations such as epidemic outbreaks and campus emergencies, so that students and teachers can have a better learning and working environment.

## 4. Effect evaluation

### 4.1 Questionnaire Survey

In order to further explore the existing problems in campus interior design under the background of epidemic prevention and control, a questionnaire was formed on the basis of data collection and field research in the early stage, and distributed to interior design practitioners, teachers and other groups, and the questionnaire was effectively collected and summarized. The questionnaire showed that about 70% of the participants believed that the current campus interior design could meet the basic needs of students, such as learning and entertainment, and provide a comfortable and spacious learning environment for children, which could meet the daily teaching needs. About 80% of the participants believe that the current campus interior design has a certain aesthetic and artistic quality, which can take into account the artistic and practical aspects of color collocation, space design, visual and auditory processing, etc. About 65% of the participants believe that cleanliness has not received due attention in campus interior design, and the campus overall cleaning system and indoor cleaning system have not been established and sound. About 96% of the participants believed that the current campus interior design could not cope with the cluster of epidemic on campus, and could not carry out normal teaching under the premise of adapting to the epidemic prevention and control. About 47% of the participants believed that smart home should be introduced into campus interior design as a necessary element to better play the role of monitoring students' temperature, maintaining air circulation, carrying out sanitation and other functions, and help build a safe campus in the post-epidemic era.

### 4.2 Interview Outline

In order to further enhance the scientific nature and precision of the research, on the basis of making and distributing the questionnaire, the interview outline was also listed, and the interviews

were conducted with the practitioners of campus interior design, campus administrators and educators, and the content feedback was obtained. The contents of the interview outline are as follows: first, the views and understanding of campus interior design; Second, the problems existing in the current campus interior design; Third, the reform direction of campus interior design in the context of epidemic prevention and control; The necessity and importance of the combination of campus interior design and smart home; Fifth, the renovation methods of some campuses and classrooms in the context of epidemic prevention and control. It is not difficult to see that most interviewees realized the importance of campus interior design reform in the post-epidemic era, and put forward a series of effective design strategies. One of the important strategies is to fully integrate smart home into campus interior design. Therefore, the power of science and technology should be used in the design process to further build a campus safety barrier, as far as possible to reduce the impact of the epidemic on campus life, especially the teaching order.

### **4.3 Interior design results**

Through questionnaire survey and interview, it is not difficult to see that the current campus interior design tends to develop in the direction of intelligent, clean and emergency on the basis of meeting the normal teaching order and the characteristics of students' physical and mental growth. On the one hand, interior design should meet the teaching and learning methods of the new era, and increase the proportion of multimedia and other intelligent elements on the basis of retaining traditional elements such as blackboard and platform, so as to ensure that students can receive knowledge faster, better and more, and highlight the important role of modern science and technology in education and teaching. Campus interior design should be fully considered, on the other hand, health needs, whether campus as a whole or classroom, should strive to build the whole health clean system, guarantee to the campus especially the key places such as classrooms clean disinfection in time, avoid caused by inadequate clean campus aggregation of disease or other diseases. Moreover, campus interior design should also fully adapt to the needs of normal epidemic air defense, not only to establish a scientific and efficient emergency prevention and control system, but also to introduce the intelligent home monitoring the temperature and health status of teachers and students, to better ensure the daily teaching order and teaching efficiency.

## **5. Is a case study of smart home integration in campus interior design in the post-epidemic era**

### **5.1 Project Introduction**

In order to better adapt to the needs of epidemic prevention and control, the smart home is planned to be integrated into campus interior design, so that the construction of campus intelligent service system can better adapt to the education and teaching in the post-epidemic era, provide convenience for students and teachers, and more efficiently assist the monitoring and prevention of epidemic on campus. [5] First, the intelligent human body temperature measuring device is embedded in the entrance of the classroom to monitor the temperature of teachers and students in a timely and efficient manner. Once fever is found, it will give feedback immediately, which will help teachers to isolate and observe febrile individuals and trigger the first shot of epidemic prevention and control on campus. Secondly, intelligent Windows should be applied to campus interior design to ensure the daily window opening time, frequency and even the window opening amplitude, so that teachers and students can breathe fresh air without affecting their learning and reduce the risk of "aerosol transmission" of the virus. Third, the intelligent fresh air system is embedded in the classroom to achieve air purification, bacteria removal and pollution exclusion inside the classroom, as far as possible to ensure the cleanliness of indoor air, so as to ensure the health of teachers and students; In addition, the smart home lighting management system can also be introduced to adjust the lighting brightness according to the time nodes of students' class, class and school, so that students can obtain

a bright learning environment while their eyesight is fully protected. In general, the project intends to introduce smart home environment adjustment system, smart home health management system and smart home lighting management system into campus interior design, and promote the intelligent transformation of campus interior design.

## 5.2 Design Objectives

In the project of the integration of campus interior design and smart home, the basic design goal is to strengthen the health management of students, help the school's emergency treatment, and strengthen the campus sanitation through the introduction of smart home, so as to better adapt to the needs of school management in the post-epidemic era. On the one hand, with the help of the smart home environment adjustment system to keep the classroom clean, realize the ventilation of the classroom, the filtration of bacteria and viruses, and the maintenance of appropriate temperature and humidity, so that the students in the classroom feel comfortable and pleasant learning environment, so as to improve learning enthusiasm and learning efficiency. On the other hand, with the help of smart home health management system, the temperature of students and teachers can be monitored and problems can be fed back in time. With the help of the Internet of Things, big data and cloud platform, students' body temperature and other health data can be uploaded in time, and students with fever can be alerted in time, so that school administrators, especially teachers, can timely understand the health status of students. In addition, the goal of intelligent lighting system is to provide students with a brighter learning environment, and strengthen the protection of students' eyesight.

## 5.3 Interior Design Smart home integration implementation process based on the post-pandemic era

In order to realize the deep integration of campus interior design and smart home, the following implementation process and measures are proposed: First, preliminary investigation. Through extensive field research, opinion collection and literature review, the problems and loopholes in school management under the background of normalized epidemic prevention and control were understood, and the causes, solutions and problems of clustered epidemics in some schools were investigated, which were used as the basis for the integration of smart home into interior design. Second, understand the efficacy and operating principle of the selected smart home, and make detailed statistics of the service life, service conditions and product prices of the smart home, and strive to use relatively high quality and cheap smart home products to bring students comfortable experience and reduce the financial pressure on the school; Three is to realize the combination of interior design and smart home, in the process of interior design, fully consider the smart home embedment, and set aside the corresponding electrical socket, to avoid the smart home can not fit and appear two rework; Fourth, conduct regular feedback research on the use of smart home, sort out and summarize the problems arising from the indoor application of smart home on campus, and record them while solving them in time, so as to provide reference for interior design optimization.

## 6. Summarizes and prospects

In the post-epidemic era, schools, as densely populated public places, not only have a greater risk of epidemic transmission, but also have become a key area for epidemic prevention and control. High density of personnel, short time of natural ventilation, long indoor class time, and inadequate sanitation have become the problems of school management in the process of epidemic prevention and control, and also become an important reason for the high incidence of learning cluster epidemic. In this context, both campus administrators and campus interior design practitioners should pay great attention to the reform of campus interior design, and realize the deep integration of smart home, especially smart home environment regulation system, smart home health management system, smart home lighting system and campus interior design. With the integration of smart home, emergency management system perfect, and the management of the students' health of body and mind

to better adapt to the prevention and control of the outbreak era demand, the establishment of open, Shared, in promoting the green, scientific epidemic prevention and control of defense on the basis of constructing campus, campus for the students to build a comfortable and healthy learning environment and living environment.

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