

Research on University Service Environment Design Under the Concept of Interaction Design

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Abstract: With the progress of society, the change of economic environment, the transformation of educational methods and the emergence of new technologies, more and more scholars have begun to pay attention to and promote the construction of campus space and innovative research. Campus service space is the intersection of teachers and students, environment and space, and its role is increasingly recognized by teachers and students. Based on the current situation of the use of university service environment and the actual needs of users as the starting point, through the analysis of the concept and method of interaction design, this paper discusses the design method of university campus service environment based on the concept of interaction design.

Keywords: Interaction Design, University, College Campus.

1. Introduction

From a literal interpretation, the word "interaction" emphasizes the two words "communication" and "mutual", which respectively represent the meaning of "communication" and "interaction". "Interaction" can be understood as the behavior action or behavior process of two objects interacting with each other to produce certain changes. In sociology, "interaction" appears in the "social interaction" written by the German sociologist G. Simmel in his book *Sociology* in 1908, which is defined as the interdependent social communication activities between people and groups through the transmission of information ^[1]. "Interaction concept" is actually the extension and development of the word "interaction", which is also reflected in interaction design.

The core content of interaction design is user-centered, mainly through the study of human behavior and psychology, to create a good user experience and feeling, the purpose of which is to improve the user's life, work and interaction mode or environment, and promote human-machine interaction ^[2]. Interaction design is the design of functionality, usability and pleasure. It can also integrate the intersection of many disciplines, and most of them are related to behavior. In life, we can find innovative ways to integrate the interaction concept into the design, so as to better serve people.

It is also necessary to introduce emotion and environmental experience factors in interaction design. The factors affecting user emotion include user behavior, habits, etc. As well as people's comfortable experience and feeling when interacting with the environment. In the process of communication between man and environment, people is the core, the environment is a service man and that people's perception on the environment mainly through people's psychological needs as a basis, the psychological demand of people's behavior is the external performance, therefore, the interaction relationship between people and the environment is a process of progressive constantly, people through the request to the environment to meet the psychological needs, Through the collision between behavior and environment, people,

behavior and space environment interact with each other, thus forming an interactive process. For example, the campus environment in The Hague, Netherlands, provides a convenient lifestyle for teachers and students through the design of environmental facilities, and creates a good communication environment.

We are in the surrounding environment all the time, and human behavior will be affected by different environments. Psychology emphasizes that humans and the environment are an inseparable and unified whole. Therefore, human behavior and the space environment are inseparable. Traditional psychology separates the relationship between human and environment. With the passage of time, more and more researchers realize that humans and the environment are a unified whole, and they influence and interact with each other. Interaction design is human-centered, through the design of the space environment, to create a good space environment experience and feeling for teachers and students. People control their behavior through psychological and physiological reactions, and behavior is the embodiment of psychological needs. Behavior and environment affect each other, thus stimulating people's understanding of the environment and forming a cyclic interaction process. For example, the environment of Tsinghua University teachers' restaurant is divided into five areas by simple spatial moving lines and partitions: dining area, leisure area, meal preparation area, water bar area and logistics area. The large area of window design provides comfortable lighting and ventilation for the indoor environment, provides the professors with meals and coffee, overlooks the Tsinghua campus and the West mountain window view, creates a good environment for them to meet, communicate, and collide with ideas, and integrates people with the space environment.

2. Interactive Objective Analysis and Design Principles of Campus Service Environment

2.1. Interactive Objectives of Campus Service Environment Under the Concept of Interaction Design

The interaction between people is the core interactive content in the space, and it is the basis of good interpersonal relationships. The content of interpersonal interaction can be divided into two forms. One is the simple information exchange between words, the other is the way to strengthen interpersonal relationships through physical contact. Each kind of interaction is mixed with the exchange of complex emotional information, which is an important connection body of interpersonal relationships. In colleges and universities, teachers and students live in a limited range of areas, interpersonal interaction has a strong degree of activity, stability and diversity.

As for the interaction between people and space, what can be provided to teachers and students is the maximization and comfort of space experience. Reasonable space feeling construction can provide teachers and students with better interactive ideas, interactive desires and interactive relationships. People and space will generate a tacit interaction relationship in the invisible, so that the space to achieve the user-centered interaction concept of the core content.

A space environment is made up of many products, especially the environment with artificial carving. Every product has an effect on the environment, which is called a "field" effect. The environment uses "field" to shape the environment space. The relationship between product and environment is the relationship between monomer and group, that is to say, product is a link of environment, and the environment will change due to the change of product [3]. Then, in the service space, facilities can create and improve the environment. On the contrary, the environment can also transform and upgrade the facilities. Facilities and the environment are related and interdependent. In the whole environment, service facilities first assume their own functional attributes and roles, and play a basic function of staying and sitting down. Secondly, they can give space and environment emotional functions.

As for the interaction of facilities in the space environment, we can consider the aspects of facility ontology, facility emotion, and facility sustainability. The ontology of the facility refers to the rationality in its material, ergonomics, scale and other aspects; The emotion of the facility includes the meaning contained in the design of the facility, whether it has the unique emotional resonance in the space. Sustainability of facilities refers to the scientific nature of the protection and management of facilities after use. Only from these three different perspectives can the interaction between facilities and environment reach an interdependent, interdependent level of interaction.

2.2. Design Principles of University Service Environment Space Under the Concept of Interaction Design

Campus service environment is an important part of campus environment. In order to fully and deeply reflect the

user's experience-centered goal and create a good and harmonious space nature and experience, the author fully extracts the concept core of interaction design from the existing problems and behavior observation in the investigation. It is concluded that the design of campus service environment under the concept of interaction design should follow the following basic principles.

2.2.1. Principles for Meeting Functional Requirements

The main audience of the service environment is teachers and students, as well as some foreign visitors. Therefore, the primary task is to meet the needs of users. With the progress of The Times and concepts, the concept of service space is more and more deeply rooted in people's hearts, and people have a deeper understanding, understanding and pursuit of it. In campus planning and construction of colleges and universities in China, there has been a shift from traditional teaching mode to new teaching concept, which is not only limited to book knowledge in the classroom, so that space becomes a second classroom with increasing calls. Thus, the requirements for such a space have changed from a simple resting function to a space complex that can meet academic, activity and social needs, while taking into account both physical and psychological needs. So, in the whole function of the construction of service environment, according to the different service space position, the scale of the function, space, space, space scale, to analyze the needs of professional users demand, activity demand, alone, tightly grasp the principle of functional service teachers and students, don't lose the campus service space of the core and the most essential design direction.

2.2.2. Pay Attention to The Principle of Humanization

"It's people who create the sense of space and experience it," Leonard said. Therefore, the realization of humanization and comfort is an important goal of campus service space construction. The original purpose of architecture is to provide a place for people to stay, and space is a place for communication. Therefore, the interactive service space must adhere to the principle of "people-oriented principle", the concept of "people-oriented" through all aspects of the design and space, so as to achieve the purpose of improving the quality of its space.

The concept of humanization is not only a recent concern, it is a kind of design concept that has been mentioned on many occasions in the society. At present, the principle of humanization and the concept of development have been penetrated into many industries and fields in the society, and are constantly improving and developing in our planning industry, architecture and landscape industry, which requires us to always pay attention to the psychology and behavior of space users as the fundamental and basis. The interaction of service space in colleges and universities reflects the spiritual outlook and cultural background of a school. Under the guidance of the principle of humanization, it breaks the traditional space uniformity and boredom, and creates a sense of space atmosphere from the user's perspective to convey the campus context. From the macro level of overall planning, such as function division and theme design, to the micro level of detailed materials, such as material texture and spatial scale, ergonomics and environmental behavior psychology run through it, truly providing a high-quality humanized campus service space.

2.2.3. Principle of Geographical Applicability

The principle of regionalization attaches importance to the

climate and cultural characteristics of the region, so what we want to achieve is to create a college campus service space and atmosphere with the characteristics of the region. In the design, we should give full consideration to the campus environment, natural characteristics, location conditions, climate and precipitation of the user's campus, and be good at discovering and mining the regional culture and spirit, as well as the relationship between the campus and the urban environment and urban background, and what kind of cultural transmission role and carrier medium role it carries in the city. Therefore, the design and construction of service space is not only the traditional connection and continuation of inheritance, as architects, we need to do is how to start from the perspective of place, find out the pursuit and expression suitable for the localization of place, and create a new image of regional campus service space and landscape of colleges and universities.

2.2.4. Adhere to the Principle of Environmental Sustainability

Environmental sustainability can be understood as human and environment sustainability, landscape and environment sustainability, as well as the long-term development of culture and environment. In the design of campus environment, it can maximize the coordination and integration of relevant elements, and finally achieve the sustainable landscape, facilities, environment and humanities. The main purpose of putting forward the principle of sustainable development is to attach importance to the planning and construction of campus ecological environment, and to increase the compatibility with the current new concept of sustainable development planning. Today's construction of colleges and universities is not only a competition of campus building, but also a hard power and soft power of culture blend facilities, soft power mainly refers to the teachers and students and scientific research level of the campus, but also includes the influence of environment on the humanities, through the environment influence to develop soft power and the overall atmosphere of the campus culture construction, adhere to the sustainable development of environment, Based on the cultural and ecological landscape, it maximizes the preservation of regional natural features and the inheritance of regional culture. It uses new means of sustainable development to achieve the reuse of campus energy and the sustainability of campus ecology. For example, in the campus space of Duke University, the designer maximizes energy efficiency consumption in the space landscape design. For example, the designer reduces the heat island effect by planting trees. Improvement of groundwater conditions through rainwater control and collection; Through its optimized irrigation system to protect drinking water resources and so on, the final design goal is to create a sustainable campus interaction space that is conducive to the needs of teachers and students, as well as cultural and historical heritage. Designers should thoroughly combine regional and campus traditional culture in the continuation of student service space, and understand and learn the relevant local regional green and sustainable development of building technology and experience, based on the concept of sustainable development, to establish an open and ecologically sustainable campus interactive service space.

2.2.5. Principle of Spatial Diversity

Colleges and universities are a place where diverse cultures blend. This is because teachers and students come from all over the world and have different living habits and regional backgrounds. They have many differences in interests and

personalities, as well as different needs for service space quality and facilities. The service space has a unique form and good inclusiveness, and shoulders the important task of realizing the diversified construction of campus quality. According to the research on behavior types in Chapter 3 above, service space integrates various types of activities such as solitude, rest, communication, exhibition and activities. Thus, the diversity of space includes personal personalized space use and public services. The use of diverse people leads to the diversification of the use of space, so, starting from the actual needs of users, only a diverse space is build to make satisfaction of the space. On the one hand, we want to create facilities, landscape and cultural diversity. On the other hand, we should start with the concept of interaction design, establish the diversity of interaction means, and start from multiple perspectives to prepare for interaction and create diversified interaction methods. In the author's research found that most consumers tend to be quiet, undisturbed private higher density and sense of personal space, causing is divided the small space utilization rate is higher, but in the process of the research found that there are more users tend to be noisy empty space, interactive place is good, because the space is more prone to mass communication activities. Therefore, according to the analysis of the results of the survey, the spatial form, supporting facilities and functional layout should be diversified.

3. Research on the Optimization Strategy of Campus Service Environment Under the Concept of Interaction Design

Excellent space creation can promote the occurrence of behavior. On the contrary, the inferior space inconsistent with the needs of users will hinder the occurrence of behavior^[4]. This section will be based on the user's actual demand, combining with the practice of case focusing on case analysis of deficiencies, the space of building elements existing problems, service space interface existing problems, service space culture and spirit build existing problems these three aspects, apply the above summary of design principles and methods, From the spiritual and cultural level to the space level to the building components is analyzed, and deeply blend in geographical elements to strategy, in-depth grasp the emphasis of the service of colleges and universities of different regions in space construction, combining with the design scheme of lower case higher popularity and popularity of campus service space has the practical significance of optimization strategy and design Suggestions.

3.1. Scene Construction and Historical Context Optimization Strategy

3.1.1. Integration of Diversified Scenarios

The integration of diversified scenes has something in common with the diversification of space. Their purpose is to provide certain conditions for the occurrence of diverse interaction modes. Through the integration of scenes, teachers and students can enhance their interest in space. Each individual participating in the interaction is a user and experiencer of the environment. The new education system is different from the traditional teaching method limited to the classroom, and attaches importance to the cultivation of comprehensive and practical ability. Because of this, more

students are full of expectation and interest in interactive experience, and they are eager to enter the service space. Therefore, design participants undertake an important mission, that is, to make their personality open, but also to ensure a reasonable and orderly space environment. After determining the direction of integrating diversified scenes into campus service space, the author divides the main scene types into the following two types: activity type and teaching activity type.

Theme activity, high frequency of this kind of situation in colleges and universities, also have higher participation, such as "top ten campus singers", "welcome party", "five, four chorus", "campus model contest" theme activities, such as more freedom and the release of such activities, mainly by the participants' interest to guide the direction, has a wide coverage, through the construction of this kind of activity, For the majority of teachers and students to build a very inclusive interactive platform. In the service space, we should strengthen the improvement of the interactive system and interactive facilities, pay attention to the degree of relaxation of the space, and appropriately increase the static space in the dynamic space for staying. While participating in activities, this kind of activity space can play a good role in displaying the campus heritage, enhance the exchange and transmission of information, and enable teachers and students to take the thematic activity scene as a good interaction platform, so as to increase their social skills and level.

Themed education scenes are spatial scenes with certain teaching purposes. Themed teaching scenes in colleges and universities mainly represent professional exhibitions and publicity of educational themes, such as "architectural model Exhibition", "epidemic knowledge Publicity Day", "architectural sketch up Exhibition", "Landscape field practice cognition" and other activities. Teaching scene as a whole is different from event scene, whole space is relatively static, has the strong study atmosphere, so in the design of this kind of service space, in addition to the interaction of the information necessary facilities of placement, more important is a sexual attraction, with novelty and interesting and thematic space scene, let more students to participate, to understand the understanding of the theme and content of teaching, Meeting participants' requirements for fun space and activity atmosphere rendering is not only conducive to the popularization of knowledge content, but also provides a good opportunity for group interaction.

3.1.2. Expression of Campus Context

As a unique social and cultural form, universities have gained experience in a long period of practice and development, experienced the precipitation of history, and formed a unique campus temperament and cultural taste. A good school image is conducive to attracting excellent teachers and students and consolidating the educational strength of the school; Conducive to the formation of a good relationship with the community, to create more opportunities for the development of the school; It is beneficial to enhance the cultural atmosphere of the school, cultivate students' realistic and innovative spirit and improve their own quality, etc. With teachers and students as the main body, it is proposed that the campus should be like the "home" of teachers and students, which is a "material environment for living, learning, traveling and resting" with affinity [5]. The image of a school will have its own specific recognition objects. For example, when it comes to Tsinghua University, it will think of the Great hall, Shuimu Tsinghua University

and the representative cultural building "Qinghua Garden" and so on. When it comes to Wu University, I will think of the cherry blossoms of Luoja, and the archway combined with the school motto of "self-improvement, Honghongyi, seeking truth from facts and pioneering". From this, we can know that our influence on a university includes our understanding of the roads, greenery, water system, slopes and facilities of the university, and more importantly, the historical deposits and footprints accumulated in the long history of the university since its establishment. In the arrangement of service space, the use of separator media with cultural elements, adding cultural exhibition walls and other means, extracting cultural symbols to bring visual cultural impact; In terms of spatial layout, more areas for display, communication and creation are designed to provide the service space for staying and create the spiritual aspect of the place. The cultural resonance places that trigger the sense of space between teachers and students are used to create a dense cultural atmosphere.

Colleges and universities have their own core culture and school philosophy, including school motto, school logo, school song, school flag, and so on. Every medium and entity in the campus space conveys cultural connotation. A good school image will cultivate the feelings and belonging of teachers and students to the school, which is conducive to the construction and maintenance of the crowd interaction and space in the campus outdoor service space. In this view, in the planning and design, we should refine and summarize the campus context of colleges and universities, and express it in the service space through certain techniques through the means of design, so as to achieve the expression and shaping of the context. Therefore, in the author's opinion, a high quality service space in a college campus must have a good expression and display of context, on the contrary, a good expression of campus heritage also promotes the sublimation of service space quality, which is an interdependent and mutually promoting relationship.

3.1.3. Protection of Historical Space and Buildings

Richard P. Dobell said: An educational campus landscape should also consider renewal, remodeling, and maintenance. There are many reasons to regard campus landscape as an endangered art form, which needs more attention, protection, explanation and help from people [6]. Spot investigation, the author mostly at many colleges and universities campus to coexistence of old and new campus, which based on the original s building, in order to meet the requirements of function, to be new, such as building in Anhui University, Anhui Medical University (south campus), such as architectural space overall exists in the form of a new era, due to the constant expansion of the city and the development, Most of the campus land scale is slightly limited, so colleges and universities choose to demolish the original old buildings to rebuild new high-rise buildings and occupy the original green space to meet the continuous expansion of college enrollment and the increasing number of students. Although reconstruction and dismantling solve the problem of the students and teachers need to be addressed at the moment capacity of, however, it is important, most colleges and universities of hundreds of years history and memories on walking in the campus landscape, campus spirit and the background is to merge with the old architectural space and coexistence, they are gone, background along with the gradually disappeared. The new modernist architecture can meet the needs of function, but it can not solve the problem of emotional resonance, and can not reflect the cultural

atmosphere and school motto spirit. Therefore, the architectural space that has been preserved through historical wind and rain should be treated seriously and protected scientifically, so that it can be permanently established in the development process of the university and become the spiritual memory and emotional sustenance of generations of college people.

3.2. Optimization Strategy of Regional Factors

Because the geographical location of a region is unique to it, it is accompanied by the different topography, climate and materials of the region. The unique regional spatial characteristics of university buildings cannot be formed without the influence of natural environment characteristics, which results in the different architectural forms and spatial forms of most universities. Geographical and natural environment is an important factor influencing the regionalism of architectural space. As for its inheritance, the author summarizes the following aspects.

One is the adaptation and application to the natural climate, combining the regional climate with the constituent elements of space. For example, due to the distinct rainy season in the regional climate, we need to consider the rain protection of the service space. Due to the high humidity in the regional air, we need to consider the protection of the material, etc., so as to adapt to the natural climate, the climate should be applied in the design and construction of the space. The second is the transformation and retention of the original terrain conditions, and the combination of man-made environment and natural environment. Ensure the balance of earthwork in the construction process, and appropriate transformation of the original natural conditions.

In the design of university service space, designers should learn to seek the interactive space direction of the combination of architectural space and humanistic level, so the integration of space and cultural elements is necessary to highlight the regional style and connotation. Through the author's field research, interview and research in the early stage of this project, the characteristics of regional cultural space regionalism are analyzed from the representative architectural works in the region. The author summarizes the following aspects:

(1) Protection, transformation and reuse of the space and form of the historic buildings.

(2) Excavate the traditional urban memory, deal with it with new means and inherit it.

(3) The representative "Hui" cultural space concept combined with spatial characteristics to develop.

(4) The use of materials and colors to arouse the emotional resonance of space users with regional and representative materials and colors.

3.3. Spatial Interface Optimization Strategy

Spatial interface is essentially the space enclosed by the skin of structures or buildings or various facilities or landscape greening, which will form different directions of space. As a result, the bottom interface, side interface and top

interface are formed. These interfaces can meet the needs of most people for open or closed space, quiet and noisy, privacy or non-privacy. Due to the particularity of the interfaces space and the creation of the space effect, it can be found that it has a high crowd aggregation according to the survey. Therefore, the processing of spatial interface is very important for the use of service space, and thus becomes an important contact medium between users and service space.

3.4. Optimization Strategy of Non-building Elements

Architectural elements and non-architectural elements are the two major elements of space composition. Therefore, for the creation of space, the two parts are equally important. It can not only provide the basic stay function of service space, but also enrich and enrich the space. The service space can better meet the actual psychological and physical needs of teachers and students for communication, sports, service, study, entertainment and other practical needs, so that the users of the space can be better combined with the atmosphere of the space, and get rid of the monotonous and boring traditional space. In this way, the core concept of "interaction design" is to be user-centered.

4. Conclusion

Interaction design concept is the popular trend of current social development, it has high research value and significance, in the space on the optimization design of the campus services should run through interaction design philosophy, adhere to group the actual interaction between teachers and students demand as the core and starting point for multi-angle, multi-dimensional, deep analysis and research, the service space of our college campus is perfected into a multi-level interactive place space that integrates behavioral interaction and emotional interaction.

References

- [1] ZHANG Ke. Research on the Application of Interactive Concept in Book Design [D]. Kunming: Kunming University of Science and Technology,2014:14.
- [2] Liao Guoliang. Introduction to Interaction Design [M], Huazhong University of Science and Technology Press, 2017.
- [3] Zhang Jinhe. Research on the Design of urban Waterfront Public Environmental Facilities under the concept of Interactive Design [D]. Harbin Institute of Technology,2013.
- [4] JIANG L. Research on optimization strategy of "grey Space" in university library based on POE theory [D]. Anhui Jianzhu University,2020.
- [5] Song Zefang, Jiuyi Lake. [M]. Beijing: China Architecture and Building Press, 2006.
- [6] Richard P. Dobell, Campus Landscape -- Functional Forms, Examples, 1st Edition, Translated by Beijing Century English Translation Co., LTD., Beijing: China Water Resources and Hydropower Press, Intellectual Property Publishing House.2005. Page 10.