A 20th-century discovery: the influence of environmental factors and space structure arrangement on teaching

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Abstract. The tradition of classroom space design is formed because people need to find a formal occasion for the dissemination of ideas and knowledge. Whether it is the earliest school in China or the earliest mode of communication in the square in the West all emphasize Teaching, the one who teaches is the leading, the dominant, and the one who learns is the passive receiver. It was not until the last century that people began to notice the significance of "Teaching and Learning" and made changes in the structure of the classroom. This article compares the traditions of Classroom space design and its functions. By doing that, it is argued that the 20th-century design of Classroom re-invent the function of teaching and learning interactions.

Keywords: Education, Significance of Teaching, Internal Structure, Space Layout, Environmental Factors.

1. Introduction

The word "education" evolved from the Latin word "Educare", which means "education" [1]. Education refers to the social practice activities that influence and guide people's physical and mental development. It took place in a certain social background and has a certain connection with the social politics, economy, and culture at that time. Therefore, the purpose of education is constantly changing with the development of history. In Chinese history, education in the primitive period originated from the needs of real life. In the period of the fishing and hunting economy, their education is to teach people how to fish and hunt birds and animals, and pick up fruits; In the animal husbandry period, education is to teach people how to erect fences, how to feed cattle and sheep, and so on. At that time, without the profession of teacher, parents acted as teachers, and people's way of education was word of mouth, behavior imitation, and so on. These are enough to show that in the primitive period, labor is learning, and the purpose of education is to survive and live. Then in the Xia, Shang, and Western Zhou dynasties, due to the emergence of classes and the prosperity of a slavery society, education began to be separated from production and labor [2]. The ruling class wanted to cultivate successors for the slave-owner class through monopolizing culture and education [3]. Education became a tool to dominate the ruled class and implement social education.

Until the spring and Autumn Period and the Warring States period, with the hegemony of princes and the intensification of land annexation, the nobles were more concerned about how to maintain their ruling position. Even if they did not study, there would be no loss, so the official school gradually declined. As a result, there was a major change in the history of Chinese Education - the rise of private schools founded by Confucius. The education in this period was based on the "education without discrimination" advocated by Confucius also proposed that teachers should be inspired and guided to teach students according to their aptitude, and advocated that there should be an equal democratic relationship between teachers and students [4, 5]. His educational purpose broke the characteristics of the monopoly culture of official schools and tended to gather the strengths of all families and give equal success to everyone in the teaching content The opportunity to be the pillars of the country. The establishment and educational purpose of private schools laid a good and solid foundation for the later education system. Until the emergence of modern schools in the 1960s, the educational purposes and methods of all dynasties in China were based on the ideological proposition of private schools.

It can be said that Pi Yong in the Western Zhou Dynasty, is the original model of private schools in the spring and autumn period [6]. The Warring States period and modern schools since the last

century are the three most important transitions and changes in schools in Chinese history, laying a firm foundation for the development and improvement of China's education. Understanding how these concepts or conventions of education changed in the last century will be the main focus of this study. This research deals with the Chinese traditional understanding with a comparative description of the Western modern understanding. It is argued that by introducing interactive teaching and learning activities, the space design of traditional teaching classrooms has been transformed to a new level.

2. Review On The Traditional Establishment

The establishment of schools and classrooms is constantly changing in all aspects. In the Confucian tradition, Xia, Shang, and Zhou dynasties are regarded as a golden age with prosperous cultures and prosperous systems, especially the Western Zhou Dynasty. The University of the Western Zhou Dynasty was also the first formal school recorded in the history books. The University of the Western Zhou Dynasty was divided into "Sinology" and "township school" according to the geographical location. The "Sinology" was located in the center and set up for the princes and nobles, while the "Township School" was located in a remote place and set up for slave owners and some common people. Thus, in the Western Zhou Dynasty, the division of geographical location turned education into a training method for noble children. The architectural characteristics of the Western Zhou Dynasty are shown in "Feng Shui". Ban Gu of the Han Dynasty in the "white tiger passes through PI Yong" intermediary Shao Dao PI Yong is surrounded by a circular ditch. The surrounding water is Yong, which means perfection, and the circular is pi, that is, the jade ritual vessel specially used by the emperor. The circular ditch around the outer edge of PI Yong, which means "water division", symbolizes the complete enlightenment of the king's way and the monopoly of education. The definition of teaching changed during the spring and Autumn periods and the Warring States period. During the spring and Autumn Period and the Warring States period, the society was in rapid turmoil, a hundred schools of thought competed in the cultural field, the official schools declined and were abolished, and the private schools rose. The rise of private schools broke the monopoly of education in the Western Zhou Dynasty. It was not only to cultivate noble princes but also open to everyone. Anyone with ideas and aspirations had the opportunity to receive an equal education. After Confucius founded the first private school in Chinese history, a large number of people at the bottom scrambled to enter private schools to teach, to realize their political ambition to contribute to the country. Private school is characterized by "indoctrination", and teachers play the most important role in the classroom. From the internal space layout of the private school, we can know that to establish knowledge-based authority, the teacher's desk is often above the steps, while the students sit under the steps, which also symbolizes that the teacher has absolute control over the discourse. Until modern times, More and more people are beginning to realize that "teaching and learning grow together "The importance of this word began to pay attention to the interaction and communication between students and teachers. Students are not only indoctrinated with knowledge but also have their thinking and dare to challenge existing knowledge. In the 1930s, during the great depression around the world, American oil tycoon Edward Harkness decided to donate to Philip Esther middle school but put forward an additional requirement: schools must create and practice a transformative teaching Law. After repeated verification and research, it integrates various characteristics and learning habits of students and then integrates them into classroom teaching, and finally forms the Harkness round table teaching method [7]. Harkness round table teaching method emphasizes that students are the main and teachers are the auxiliary. Students are allowed to study around a round table with the main purpose of discussion. Such a form of learning completely disintegrates the meaning of authority, implements the idea of anti-centralization, and allows students to fully interact and participate in the classroom. The introduction and implementation of Harkness round table teaching method in China have brought a far-reaching impact on China's educational significance by changing the internal structure of the classroom.

The continuous change of classroom structure and the continuous change of classroom internal space layout mean that the significance of teaching is constantly reshaped. The significance of education has changed from the orthodox class monopolizing culture and education in the Western Zhou Dynasty to cultivating talents for governing the country, to taking education as a means of governance and directly serving politics in the spring and autumn and Warring States periods, and then to the purpose of challenging the authority of knowledge and establishing students' ideological system in modern times. It can be said that the significance of education is constantly updated and developed to "tap self-potential and find self-nature". The future educational significance should let people focus on "self" in the learning process, meet their curiosity, meet their desire to explore, and meet their happiness of thinking. The design of classroom space in the future has a great impact on the significance of teaching and the psychology of teachers and students.

3. Influence Of Classroom Space Layout On Teaching

In the context of the new era, there are diversified possibilities for the development of education, and the design of classroom space needs to be comprehensive and interactive [8]. Traditional education is a one-way model in which teachers transmit knowledge to students. Therefore, the traditional indoor space planning is based on the needs of teaching, putting the teacher's space in the classroom at the front of the classroom, and the students sit opposite the teacher in turn. The disadvantage of this layout is that even if students face the teacher, they will have a sense of psychological distance, thus losing the desire to communicate with the teacher. The beneficiaries of the whole classroom space are very limited, Such a one-way communication arrangement makes it difficult for students to achieve two-way communication, and will also lead some students to enter a vicious circle of "unable to fully participate in the classroom and getting worse and worse". The modern education concept is a diversified teaching mode, so it needs space to meet different teaching methods [9].

It is required that architectural space can be quickly and flexibly divided into multiple small spaces according to the adjustment and needs of teaching methods, to meet the needs of multi-level teaching and increase the inclusiveness of education space. The future educational space structure can arrange students on both sides for a face-to-face layout or present a circular layout around the center of the classroom. This layout is conducive to students' discussion and forms full interaction between students and teachers and students. Peter Barrett, a professor of property and building management at the school of architectural environment, University of Salford, UK, conducted a study on 27 primary schools, 153 classrooms, and 3766 students in the UK. It was found that simply changing the design and layout of classrooms can have a significant impact on student's academic progress. A good classroom layout can improve students' attention, improve their behavior, and support learning outcomes more effectively [10]. In the classroom space layout, the concept of "ownership" can also be used for design. It refers to making people feel that they have the surrounding space in a space. The higher the comfort and sense of belonging of students in learning, the easier it is for students to enter learning. In addition, the flexibility of classroom space layout is also necessary. Different layouts are carried out according to the education mode on that day, to make the classroom adaptive. For example, when teachers want to emphasize the performance of students' mutual communication in the form of group cooperation, turn the classroom layout into a space division with groups as units or a semicircular layout centered on the podium; When teachers want to create a stable and quiet classroom environment, they can face the podium in rows and columns. Installing rollers on the desks and chairs of the classroom can play an important role in the flexible change of the classroom layout. The researchers found that a flexible classroom layout has many positive benefits. First of all, it creates a lot of open spaces. Students and teachers can walk around the classroom and interact with others.

The freedom of action promotes the activity of thinking at the same time. Secondly, although students usually work in their groups, if they encounter any problems, they can communicate with

other groups at any time, absorb multi-dimensional opinions, promote the formation of a learning community, and virtually create a more positive learning atmosphere.

4. Impact Of Environmental Factors

In classroom design, the environment is also a factor that designers must consider. Environmental factors include lighting, temperature, the color used in the classroom, and even the air quality in the classroom. Lighting design not only affects students' eyesight but also affects students' learning enthusiasm. The uneven distribution of classroom lights, too high color temperature, and serious glare all affect the mood of students, including teachers, and their attitude towards learning to vary degrees. When setting up the lighting design of the classroom, first of all, we need to give priority to the eye needs of teachers and students. For example, we need to use blackboard lights above the podium area to focus the brightness on the blackboard, and the lights in the middle of the classroom can effectively prevent glare by using reasonable lighting spacing.

Secondly, the color temperature of classroom lights should be kept at about 6500k. The high color temperature of cold light is easy to cause people to be more excited, and the low color temperature of warm light is easy to makes students feel sleepy. The color temperature of 6500k is in the middle of cold light and warm light, which is more suitable for students' learning environment, making the space open and refreshing, and creating a more friendly teaching environment for teachers. The indoor temperature also affects the enthusiasm of teachers and students for teaching and learning. According to physiologists, high indoor temperature will affect people's thermoregulation function. The symptoms of high-temperature rise caused by poor heat dissipation also lead to irritability, slow thinking, and poor memory. Therefore, the efficiency and quality of learning decline. The appropriate temperature can make people feel comfortable and are of great help to improve people's thinking activity and work efficiency. The use of color in the classroom is also rigorous and exquisite. In the color design of the classroom, we need to consider the use purpose of space. The different color composition has different effects on the embodiment of personality and the formation of the atmosphere; Considering the orientation of space, color is closely related to the environment. Especially indoors, the reflection of color can affect other colors, and color needs to be coordinated with the surrounding environment; Considering the length of time users use the space, the color of the room used for a long time has a much stronger visual effect than that of the room used for a short time, and there are also differences in the consideration of color hue, chromaticity contrast, etc. for the space with long-time activities, the color that does not produce visual fatigue should be considered first. The color effect depends on the relationship between different colors. The color effect of the same color can be quite different under different background conditions. The presentation of color is closely related to psychology and physiology. For example, when we look at red for a certain time, then turn to the white wall or close our eyes, it seems that we will see green. This phenomenon is the instinctive adjustment of visual organs to color stimulation.

Furthermore, if a bright red wall is installed in the classroom, students will have a violent, irritable, and even repressive psychological reaction if they stare at the red for a long time. The application of comfortable colors in the classroom will make people feel relaxed and cheerful, to enter learning in a fuller state. According to a research report of nich, the breeding of adding green plants in the classroom plays a positive role in both physiological and psychological aspects. People are naturally biological and have a natural preference for the elements of the natural environment. The addition of green plants will enable students to focus their attention on the learning process and study with a soothing and calm attitude. Indoor plants can also improve students' learning environment by reducing air pollution and carbon dioxide content. According to a survey by Dutch researchers, in classrooms with plants, students' health problems are reduced by 7%. The healthier students are, the stronger their creativity will be, so their test scores have also increased by 20%. To sum up, various environmental factors in the classroom have a direct impact on students' interest in learning, their mood and learning efficiency.

5. Conclusion

According to the comparison of the characteristics of the internal spatial structure of schools in the Xia, Shang and Zhou dynasties, the spring and autumn and Warring States periods and the 20th century, we can find that the internal structure of the classroom is closely related to the educational significance at that time. We can clearly find that with the continuous renewal and development of educational ideas, great changes have taken place in the layout of classroom space. The internal space setting of the classroom, especially the layout of the classroom and the environmental factors in the classroom, has a profound impact on students' learning enthusiasm, students' learning efficiency, students learning methods, teachers' education methods, and the mood of both students and teachers in school. In the future, in the process of classroom interior design, designers should pay more attention to the design of spatial layout and environmental factors, maximize the use of the flexibility, comprehensiveness, and interactivity of classroom space for spatial layout, and pay attention to the coordination and rational use of lighting, color, temperature, visual effect and natural elements in the indoor environment of the classroom, to create an ideal educational space for students and teachers as much as possible.

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