

Innovative research on urban public art design from the view of interactive experience

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Abstract. with the continuous progress of social technology, people's demand in the material, spiritual experience and living environment has been further promoted. The urban infrastructure and other hardware functions have been achieved. Therefore, people began to develop urban public art design, in order to further promote the urban beautification environment, and ensure the quality of people's living environment. Nowadays, urban public art design has drawn the social development attention. This paper put forward the combination of technology and art, interactive experience enhancement, public participation and information design innovation direction., through the analysis to urban public art design innovation research on the perspective of interactive experience from the domestic and foreign cases.

1 INTRODUCTION

Modern urban public art originated after World War II, and both modern city and urban civilization can play a key role in the recovery of people's spiritual trauma. In the development process of urban public art in China, some scholars have successively put the design from public into a full fit in the future social history and humanistic ecology. Because the openness and interactivity are not only the basis of urban public art works, but also the key to further improve the public participation and the voice of public. With the development of urban public art design, as a form of urban sculpture, its absence has become the interactive innovation of urban public aesthetic design. The urban public space environment as the historical background, and the media means, realizes the interaction of people's daily life and public art, and realizes the enlightenment and aesthetic needs of public theme in public life entertainment.

Then, what is the urban public art? and what is the public entertainment? As an increasingly important cultural form in today's cities, urban public art plays an increasingly prominent role as a cultural carrier and a city landmark, and becomes a symbol of the city. And public entertainment activities refer to games or activities on the Internet or in public entertainment places that give participants fun. They are more and more important in our daily life.

2 RESEARCH REVIEW AND CONCEPTS

The word "experience" originated in Hegel's letter, it is mainly used to describe his trip. "Experience" in German

is made by "experience", directness being used as its characteristics, mainly refers that the inspiration is from the direct feeling and their own energy. Experience was used to make consumers feel the humanized service better. This is the so-called "experience". With the era of experience economy as the background, then "experience" can be described as providing personalized experience services to consumers. Some scholars believe that experience innovation can achieve personalized and evolutionary experience, and other means are all designed to achieve this goal.

Since World War II, modern urban public art has been developed, and its role is to recover people's psychological trauma, construct urban and urban culture. With the development of urban public art, researchers should put the urban public art design into urban cultural ecology. Besides, the construction of urban public space has rich forms and connotations. The essence attribute of urban public art is public and interaction, which not only improves the public participation, but also increases the public discourse power. With the development of urban public art design, it is not a form of urban sculpture, but has become an innovative design of public aesthetics in the interactive city.

According to the appeal, interactive experience under the perspective of urban public art design innovation needs the urban public background, and the technical means, to realize art pursuit, and ensure that people can interact with urban public art in urban public life. So as to realize the public entertainment enlightenment and aesthetic needs in daily life.

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3 The importance and advantage of urban public art design

3.1 The importance of public art design

The rich and diversified forms of urban public art in the new era make some people ignore the concrete expression of art design form, ignore the three-dimensional and three-dimensional art form in urban public art design, and gradually forget that art design form is the real source and beginning of public art design. It used to be produced to become the main and highest proportion component of public art works in modern cities. At the same time, two-dimensional plane is also the most basic element in the composition of three-dimensional space. In the design of urban public space, wall, floor and top interface are also an indispensable part in the design of complete three-dimensional public space. Therefore, the art form of graphic painting in urban public art should still be a necessary part of the public's concern and attention.

3.2 Advantages of public art design

The reason why urban public art design is proposed is not only because it is the origin of urban public art, but also because it has more abundant and outstanding advantages compared with other three-dimensional or three-dimensional public art. In the face of the rapid development of urbanization in China, land resources are increasingly scarce, and the flat form of public art expression can convey the information of art, humanities and science without occupying the volume of urban public space, so it can greatly save the physical space resources of the city. Whether it is a large building facade, a continuous wall beside the street, or a manhole cover or a sign on the ground, architectural appearance can be used as the performance interface of urban public art design form. Therefore, as a type of urban public art design, it should be inherited and carried forward in modern Chinese communities.

4 The Current Situation of Urban Public Art Design

4.1 The lack of urban public art

At present, Chinese people's cognition of urban public art is still not enough, mainly because the concept analysis of urban public art has not been popularized, and the development of different regions is not balanced enough. In some large cities, due to the lack of urban public art, the construction personnel are too modern. Although they can realize the basic use function of the urban public, but the spiritual needs of the urban public do not considered in cultural identity, which ultimately causes the urban public space design to be too similar.

4.2 The way of urban public art information transmission is single

In terms of information transmission, the transmission mode of urban public art is very single, because it is to convey information through vision and touch. Difficult to fully meet the needs of the public experience, and each information carrying equipment is designed separately, there is no connection between the two sides or more people, so when the transmission of information repeat or lack should not appear problems, eventually difficult to let people in the same public space timely and effective access to the need of useful information.

4.3 The unity and strength of urban public art

Compared with other countries, the development of urban public art in China lags behind, and it is influenced by many aspects, resulting in the blind catching up of the construction of urban public art, and it is not designed according to the specific landscape environment planning. The shapes and specifications of many city squares in China are very similar, and there is a separation between urban public art and urban landscape environment, which does not significantly highlight the image and cultural characteristics of the city^[2].

4.4 Public participation in urban public art is not high

At present China's urban public art design also exists the contradiction of inheritance and innovation, in the face of Chinese five thousand's culture history and modern art conflict and collision, designers how to highlight our culture, how to tolerate modern art, according to different content and environment, need to use what design concept, techniques and elements, and make urban public art popular are most need to pay attention to at present. Secondly, the interaction between urban public art and the public is still stuck in a single visual and tactile sense, and it still lacks the integration of public feelings, so that it is difficult to arouse the resonance of art, culture and public emotion. But only pay attention to the public preference is difficult to design excellent design, such as a very noted concept artist has held a "user-centered art" experiment, which was disgusting in the process of the survey of the questionnaire . It mainly because of the lack of certain artistic effect. Therefore, when carrying out the popular-centered public art design, how to weigh and consider the advantages and disadvantages of the preset design is also a big problem that the modern urban public art designers need to solve^[3].

5 Development Direction and Innovation path of Urban Public Art Design

5.1 Integration of technology and art

With the development of the virtual reality (VR), augmented reality (AR) and motion sensing interaction,

and the close combination with the design industry at the same time, urban public art design get more development space. How to make technology more integrated with art is the main problem that current city public art designers need to pay attention to.. Modern urban public art has too single expression form ,and the convergence of design forms. Therefore, under the wide application of interactive technology, the urban public art should turn to the diversified development of interactive mode, which is also conducive to the integration and development of technical means and artistic expression forms. In the literature [4], the public art of a celebration abroad, in part of the light show is in William Joe ley bridge, the bridge as a canvas, let many famous artists can through geometric line graphics, bright jump color and experimental ideas to reflect the style of architecture. Please refer to the renderings in the literature in detail[5]. The data calculation formula of augmented reality (AR) technology is (1)

$$\begin{aligned}
 X &= (u + v) \cos \beta_{2000} \cos \gamma_{2000} \\
 Y &= (u + v) \cos \beta_{2000} \sin \gamma_{2000} \\
 Z &= \{u + (1 + l^2) + v\} \sin \beta_{2000} \\
 U &= \frac{a}{1 - l^2 \sin^2 \beta} \quad (1)
 \end{aligned}$$

In the the fusion of the city public art technology and art, the fixed art form of the past or traditional city sculpture will be impacted. The usage of various technologies (motion sensing interaction sensor, digital display system, computer, communication tools, LED, virtual reality technology)will provide more spiritual experience, aesthetic experience and behavioral interaction for the urban public[6]. Under the combination and application of various interactive technologies, the effect of urban public art design will be gradually enhanced, so as to construct an immersive entertainment and aesthetic experience. This happens in big data, cloud computing and 5G technologies (see Table 1).

Table 1. shows the comparison of 4G and 5G key technical indicators.

qualification	4G reference value	5G target value	Elevated multiple
User experience rate	10Mbps	0.1-1Gbps	At 10-100 x
flux density	0.1Tbps/km2	10Tbps/km2	100 Times
Connect number density	105/km2	106/km2	10 Times
Air time delay	10ms	1ms	0.1 Times
mobility	350km/h	500km/h	1.43 Times
energy efficiency	1 Times	A 100-fold increase	100 Times
Spectrum rate	1 Times	Three to five times the increase	100 Times
Peak rate	1Gbps	20Gbps	20 Times

5.2 The concrete application of AR and VR technology in urban public art design

VR technology is vivid. It can inspire the public's

creative thinking and imagination through three-dimensional graphics, videos and other means. When applied to the public art design, it can enhance the expression of public art; The biggest feature of VR technology is the interactive, which can be divided into four types: motion capture, tactile feedback, eye tracking and gesture tracking. Through these interactive ways,VR technology can bring the public a sense of immersion. When applied to public art design,VR technology can enable the public to better appreciate and understand art, and it is also more conducive to the public's feedback on art works and convenient for artists to communicate with the public.AR technology can break the boundary between virtual and real. Artists can bring specific equipment and freely build their own world, which can stimulate the imagination of designers to the greatest extent and create better works[7].

5.3 Interactive experience

The term "experience" is applied in many areas. For example, the book, *The Experience Economy*, is regarded as another economic growth point after agriculture, industry and taking industry. The proposal of interactive experience comes from the appeal that the development of interactive technology need to involve . The impact of interactive technology development on the traditional urban public art design can be used as a blow of "dimension reduction". The experience of modern urban public art is weak, which is not only the lack of technology, but also the lack of design concept. The development of urban public art design needs to pay attention to the sense of experience, and improve the correlation between participants, urban public art and the whole landscape environment, so as to provide excellent interactive experience for the urban public[8].

In the field of public life, people will experience a more direct, diversified and profound design of urban public art experience. In the process of designing urban public art, designers need to preset the bad experience of goals and technology to ensure the continuous effect of the experience. In the design, some significant device location, use instructions, and the device to prevent the area is very important, it determines whether the public can clean to see the device and no "obstacles" to use, even can see whether the perspective is the best view, these factors can affect the public experience[9].

5.4 Public participation

At present, the way of urban public participation is relatively simple, and it still stays in a single visual and tactile sense. The interaction between the urban public and the urban public art is not strong, so it is difficult for the urban public to arouse cultural and emotional resonance with the urban public art. Public participation under the interactive experience is based on the interactive technology, integrated the urban public into the urban public art design, and integrated the public emotion into the interaction. The results will be completed together by the urban public and designers.

Mass participation in urban public art includes designers, urban public, other social public, and urban public space. At present, the public participation in the urban public art is too simple, and the elements that can participate in the urban public art design are minimal. So we can refer that the "cloud gate" of Chicago, using elliptical and reflective production materials for urban public provides more participation in entertainment experience, at the same time, the landmark buildings in the range of the launch can include the whole Chicago in it, and achieve the perfect interaction effect of the people with public art, landscape and public art.

5.5 Informatization

Information has become the mainstream of The Times, and a large amount of information can be produced anytime and anywhere in the process of urban public life, and the security of information, the effective and convenient use of the team emblem play a key role in the construction of a modern city. The design can also be successful in the process of urban public art design. After understanding the different experiences of the urban public, the personalized and targeted interactive experience of different experiences, interactive content, interactive form and interactive information are calculated and the budget is processed to avoid existing or possible problems and risks, so as to build a good public life experience for the public^[10].

6 Conclusion

Interactive technology has promoted the integrated development of urban public art technology and art, and reflected the value of interactive experience, public participation and information design. Among them, the first value is the cultural value, which can construct the city brand, enhance the city vitality and the people's culture and art. The second value is the value of public service, making full use of technical means to realize the innovation of urban public management and service, so as to realize the public participation in urban public art management mechanism. The third value is the economic value. Under the innovation of urban public art design, the industrialization and economy of urban public art have been further developed. The last value is the value of design rethink. After designing the interaction of ways, ideas and experiences in urban public art, it can fully provide the experience of participation in urban public space.

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