



Status Quo, Measures, and Future—An Investigation Based on the Current Situation of the Development of Science and Technology Museums in China

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Abstract. With the change of generations and the increasing significance of science and technology in a country, the importance of science and technology museums and their educational functions for students have gradually become prominent. The reports and literature on domestic museums have also gradually increased, reflecting that museums' scientific and technological status, social status, political status, and educational status are constantly improving. Therefore, by reading some materials and combining current affairs news, starting with the current situation, measures, and future of science and technology museums to elaborate on the development of science and technology museums in multiple dimensions.

Keywords: museum of science and technology · status quo · measures · future

1 Current Status of Science and Technology Museums

1.1 Unbalanced Regional Development and Uneven Types

In a sample study of the regional distribution of 500 museums in 2019, we can see that only 10% of science and technology museums distributes in the relatively low economic level of the central and western regions, such as Sichuan and Guangxi. While upon 90% of science and technology museums distributes in the eastern region, of which the Pearl River Delta region, the Yangtze River Delta region, the Beijing-Tianjin-Hebei region, and other areas of rapid economic development occupied about 40%, and most of them distributed in the capital cities of these regions. According to the process of building museums since the 1950s, most of the museums in China were established on the original sites of celebrities, such as Zhu Kezhen Memorial Hall, Su Buqing Inspirational Education Hall, and Tan Jiazhen Life Science Education Hall. It belongs to the developed area of China's scientific geography map, so it can explain the phenomenon of uneven regional development (Tan Ruijia, Wang Chuanchao, Zhang Meifang, 2021). According to the continuous development of the "modern science and technology museum system with Chinese characteristics," China's science and technology museums based on popular science and leisure have gradually formed. However, due to the lack of facilities,

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science and technology museums, such as science and technology museums that are more academic in nature and astronomy, rely more on local infrastructure construction, making it difficult to popularize them.

1.2 Status of Talent Utilization

As the educational function of science and technology museums is becoming more and more prominent, it is also necessary to conduct research and understand the current situation of the composition and use of internal talents. During the survey, some results showed that the content of China's science and technology museums was outdated, and the museums collided with each other (Yang Qian, Wang Yinan, Liu Kun, Xu Dan, Zhang Tianhui, Wang Cong, 2021). The research on whether people can give full play to their talents is affected by external factors such as whether people get the staffing and job requirements. Therefore, 50.63% of the people think they are not sure, only 16.64% think this situation does not exist, and 32.64% think it exists. Moreover, this situation is familiar according to the research on other data.

1.3 Other Aspects

The Sixth Plenary Session of the Seventeenth Central Committee of the Communist Party of China has already pointed out that it is necessary to increase the funding for public welfare cultural institutions and, at the same time, use this to develop prosperity of socialist culture. However, in terms of counterpart capital investment and resource sharing, due to the sense of separation in management, such as the lack of relevant attributes between science and technology museums and higher-level competent departments and the lack of solid business and resource connections between museums, the social funds of science and technology museums have been reduced. Investment and government investment are not enough to support long-term development. In terms of volunteerism, China's science and technology museums will recruit some volunteers for college students to meet the museum's shortage of highly educated personnel and provide internship opportunities for college students with related majors. College students only have enough free time to go there during the winter and summer vacations. Therefore, in the survey of recruiting volunteers in recent years, we know that more than 80 students fill in their volunteers, but only half of them go to the offline venue for interviews.

2 Related Solutions

When facing economic problems, we should explore the science and technology museum's various values. Schiele, a researcher at ICOM, believes that science and technology museums will go through four periods: the period of technological development, the period of contemporary technological development, the period of public understanding and exposure to technological development, and the modern period of emphasis on the development of the relationship between technology and society (Liu Li, 2015). Accordingly, China's science and technology museums need to focus more on

the history of the development of science and technology itself and build on the existing infrastructure to improve the collection and the museum's professionalism and scientific nature. In addition to the museum's problems, the problem of uneven regional development, promoting strengths and avoiding weaknesses without deliberately pursuing an excessive balance, that is, by improving the functions and professionalism of individual museums, such as in the central and western cities.

In terms of economy, it can be combined with science and technology museums to increase income under technological development. For example, use multimedia to add color to the exhibits in the museum when facing complex subjects that require high knowledge of visitors, using multimedia technology, touch screen technology, and LED display. The interactive capabilities of the screen and the combination of surveying and mapping multimedia scenes with games can better allow visitors to extract exhibit information, such as geographic information annotations in ancient map relics. Furthermore, multimedia also apply to enhancing museum education functions. The connotation of situational learning theory is that learning is a social, practical, and individual participatory process that uses differential resources as a mediator. (Zhao Xingyu, 2017). Museums can use STEM curricula to improve students' interdisciplinary learning ability and practical application of science and technology. First, museums should build curriculum teams and special exhibits, set disciplinary curriculum goals, choose curriculum content and teaching strategies, and refine and evaluate them according to curriculum needs. (Zhang Xinli, 2021). In the application of new technologies, referring to VR technology combines offline real-life immersive interaction with an online restoration experience to give full play to the imagination of the audience and the novelty of the science and technology museum.

Regarding media, China's science and technology museums also need marketing and media diffusion to gain more attention. Through social marketing, museums can produce brand effects, expand the popularity of venues, and establish a good social image. Many museums in the world have improved the popularity of venues through market research and marketing. For example, The Children's Museum of Science and Technology in Yokohama, Japan, renovated the museum by surveying a sample of Yokohama residents and elementary and middle school students. Moreover, The National Museum of New Zealand gained significant economic benefits through temporary exhibitions and extensive publicity in various media. (Zhao Xin, 2016). Therefore, China's science and technology museums can use social media, such as WeChat public accounts and visual films, to promote by learning successful cases, and at the same time, carry out targeted communication by outputting high-quality content and focusing on the differences in needs.

Science and technology museums can enhance their local presence by leveraging their aesthetic value. First, science and technology museums should emphasize using new technologies and materials in the design phase to enhance their presence in the region with novel designs and new technological experiences. Second, in the design phase, symbolism and abstraction are emphasized. For example, in the Beijing Planetarium, the connection between the new museum and the old museum is reflected by installing a celestial body of spherical mass on the dome of the old museum and designing the new museum as a distorted space due to gravity (Zhang Tingting, Mei Hongyuan, 2007).

3 Significance

In terms of the educational function of museums, science and technology museums can also improve the reform and progress of relevant aspects of the audience. First, in terms of strategy, adhere to the “combination of museums and schools.” In Europe, most museums have adopted the combination of museums and schools, which not only promotes the increase in the number of relevant talents but also ensures the specialization of museums. By continuing to promote science education, our education will promote interdisciplinary concepts through integrating science, technology, culture, society, the environment, and engineering, enhancing the vitality of contemporary students and science and technology museums. Therefore, the collections of science and technology museums in China are mainly animals and plants, machinery, and scientific and technological instruments. Most science and technology museums have interactive links such as scientific practice, VR facilities, teaching practice, and exhibit explanations. Maximize promoting the sustainable development of science and technology museums and advancing educational functions (Zhu Youwen, 2018).

In addition, through the improvement of the museum’s internal facilities, such as the lighting system to intelligent design, through the combination of control panels, computer systems, and digital products such as iPad achieve, the museum’s different thematic exhibition hall display effect. Moreover, the intelligent lighting system can also reduce light radiation to a certain extent, thus reducing the exposure and damage to cultural relics. At the same time, each museum can exhibit the museum’s characteristics of technology and archaeological techniques or processes, such as through a power display method to demonstrate ancient technology processes.

At the same time, as a symbol of a country’s science and technology culture, the development of science and technology museums can also promote the development of international relations. For example, by organizing the ICOM Science and Technology Museum Expert Committee, it is possible to discuss current hot scientific and technological topics. At the same time, it is also suitable for promoting the cultural image of a country. For example, the Yongle Bell in the Ancient Bell Museum of Dazhong Temple can make foreign friends realize that in ancient times, the Chinese could continuously form rich overtones according to the thickness of the bell wall.

4 Future Challenges

In the era of continuous development, as a concentrated expression of a country’s science and technology, ideology, and educational effects, science and technology museums should keep up with the changes and development of the times to continuously adjust their internal management systems and exhibit types. Besides, science and technology museums also face how well the exhibits fit in with the changing times and the exchange and integration with other cultures. For example, some surveys have shown that science and technology museums need to improve the construction of leisure and entertainment infrastructure and related spaces. Ignore the use of techniques to display collections. In addition, the educational functions of science and technology museums need to continue to progress with the times, such as clarifying the value of education within the museum and thus posting quotes about education in the museum to penetrate deeply.

5 Conclusions

In a nutshell, in the current process of developing science and technology museums, there are a number of problems which are required to be solved, such as unbalanced regional development, inadequate types, insufficient use of talents. In order to deal with the above problems, it is critical for relevant departments to put more emphasis on the importance of education, science popularization and aesthetic functions of science and technology museums, increase the related investment to improve the current infrastructure and introduce supportive measures accordingly. With all being done, the mechanism and strengths of the operation and development of museums can be greatly enhanced, which is critical for continuous development of science and technology museums in China.

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