Research of New Media Technology Application in Moral Education Exhibition Space in Elementary Schools

Chao Huang

Nankai University Binhai College

Tianjin, China

Abstract—**The interactive, virtual and innovative new media technology in moral education exhibition design in elementary schools is analyzed in depth with new media technology as the background and new media application as the entry point in this paper, so as to enhance the interaction between experiencer and exhibition forms and to strengthen effective information transmission through new form of information transmission. Moral education exhibition in school in new media environment is the extension and expansion of traditional exhibition forms and this is an emerging area, so it is conducive to widening the horizon and education platform for ideological and political education, to changing the modes of expression of traditional ideological and political education. In addition, in the information transmission system of these public exhibition spaces, the effect of new media is not just on the surface, but it changes the mode of transmission essentially, which can make the change a revolutionary one. Moreover, it strengthens the influence on education object by subject, as well as the initiative and consciousness of participating in education with object. It also brings about challenge against the mainstream ideology of ideological and political education transmission.**

Keywords—moral education exhibition space; new media technology application; interactive design

I. INTRODUCTION

New media technology is emerging with the arrival of the era of technology and information, and it has been applied to design in a lot of fields. Among them, the convenience brought by the application of new media technology in exhibition space design is obvious to all. It is used in large comprehensive exhibition in various exhibition halls and museums, and is praised by the artists. Moreover, a great many works combining excellent art and technology have been created. However, the current exhibition space in elementary schools, whose form is stiff, is in the traditional stage without enough study.

The exhibition mode of moral education exhibition in school should also keep pace with the times. As a result, innovation should be made in combination with the reality, new moral education exhibition mode be designed using new media technology, and new learning approaches of moral education exhibition space be explored, so as to discover the mode of interaction between new media technology with students in moral education exhibition space design.

With respect to the research of the application of new media technology in moral education exhibition space in elementary schools, it is still in the initial stage both at home and abroad by viewing the data currently available. There is no substantial research achievement, so the topic of research and application of moral education exhibition space design in new media environment is not only of important design and research value, but also plays the role of expanding new field and acting as the pilot. In addition, it increases the effectiveness of the development of moral education in elementary schools, and both its purpose and significance are worthy of discussion and study.

II. EXHIBITION SPACE DESIGN AGAINST THE BACKGROUND OF NEW MEDIA TECHNOLOGY

A. Combination of New Media Technology and Exhibition Space Design

New media technology and exhibition space design are two relatively independent areas of specialization, but there is no conflict between them when put them together, on the contrary, they form a new means of creation. All the artistic forms and space expression should be realized through the technological means of virtual reality technology in the new media environment, so the activities of exhibition become more colorful. Actually, the realization of virtual reality is to make digital coding of material information in the real world, change it into digital information, put in the digital information by certain program logic, and last, output the perceptional information of the real world, such as vision, auditory sense and touching, so as to be perceived by human body. Thus, it can be seen that, specific program logic, as the backing part of the whole information transmission process, is an indispensable part of information exhibition. [1] Its application in exhibition space design will be popularized with the rapid development of new media technology, offering visitors more unusual experience and expanding

---

[1]   Wu Tao. Application of Virtual Reality Technology in Architectural Design. Engineering Design and Intelligent Building, 2002, 15

people' vision. Besides, the combination of new media technology and exhibition space design will inspire the designer to create more works with soul.

Under the premise of exhibition design, such combination makes new media technology serve the exhibition space design. It is a means of design, being able to produce richer effect. It is the freer media, identity and vision, making the space reasonable and interesting. Relying on the support of advanced computer technology and superior network, it is reflected that the new media technology is manifested and implemented in exhibition space design in a better way.

B. Application of New Media Technology in Exhibition Space Design

New media technology integrates into people's life gradually. Its presence has brought about huge changes to exhibition design, and the expression forms from different professional contents have expanded the exhibition modes of contemporary museums, technology exhibition halls and other places.[2] The rapid upgrading pace in information era has made the design concept with technology for survival evolve into the people-oriented design concept gradually, and the information exchange between human and computer starts to turn to the communication with user interface.[3]

The overall concept of exhibition space is divided into two parts, namely, physical space and virtual space. The former is the traditional space environment that everyone involves in, while the latter is the new media technology to be used. It enables people to be involved in the environment totally, and to be able to feel and touch. For instance, a building in the distance can be seen in terms of its physical form, and its special environment can be felt nearby. Thus, the characteristics of physical space can be seen directly, while virtual space needs to be perceived. The two are the indispensable part of exhibition space.[4] As for the designer, it can expand wider and more flexible design thought, change the previous thinking mode in creation process, add in bold attempt and decrease the limitation of rules and regulations, having promoted the development of new media technology in exhibition space design. The traditional exhibition form is simple, and it is diversified and turns to virtualization with the addition of new media technology, developing towards three-dimensional design from the previous two-dimensional graphic design. New media uses the photoelectric technology and projects using a projector, creating a dynamic virtual space, offering the effect of being personally on the scene, and deepening the experiencer's feeling of new media technology.

It shows the diversified and autonomous exhibition design, the vivid, interactive and creative interaction exhibition as well as the expansible space exhibition. More energy can be injected into the media in China's museums and exhibition halls by improving the exhibition modes of new media technology constantly while seeking from these characteristics.

C. Influence of Multimedia Technology on Exhibition Space Design

The living standard is enhanced day by day. Not only the network information era, but also the constantly upgrading electronic products and continuously increased intelligent facilities, indicate that the future society will be filled with science and technology, and people's thought should also keep pace with the times. The positive and reasonable and good factors should be carried forward while abandoning the bad ones. The comprehensive development of factors of denying negative and losing inevitability starts to influence the future of exhibition space design.

First of all, exhibition space design is to transmit useful information to visitor, so one of the significant influences is information integration. After using the equipment of new media technology, more disorderly information can be sorted, planned and classified in a uniform way, making the previous exhibition information be integrated and optimized.[5] In this way, not only the space is used efficiently, but the problem of information shortage is also made up. For instance, in the museums of some countries, a lot of precious historical pictures and images cannot be shown to the audiences entirely due to the limitation of exhibition space, but the static pictures can be played on the screen by way of circular rolling after the electronic screen technology is applied. In addition, a lot of interactive, voice-activated equipment with touch screen and electronic book turning can serve as a medium to store the contents to be exhibited. Therefore, the integrity and accuracy of information is one of the important links of exhibition space.

Second, the traditional exhibition space is boring and simple, so the addition of interesting exhibition contents is beneficial to attracting more audiences and being absorbed in a better way in terms of the exhibition content. This is resulted by people's curiosity, hobbies and interests. For instance, with respect to the design of science and technology museum, it contains large amounts of complex information as the museum plays the role of educational propaganda and popularizing scientific knowledge to the audiences in a more vivid way. It is a test on design requirements to change the academic content to be popular and easy to understand. The tedious exhibition will wear away the audiences' patience, so the demonstration of these scientific principles using simple devices that are easy to understand will be accepted by the audiences more easily.

2   Zhu Yiling, Zhu Fei. Analysis of Media Technology Innovation Type — On Its Application in China's Contemporary Museum. Journal of Suzhou Art & Design Technology Institute, 2015(4):27-30.

3   Hu Zhenghua, Zhuang Changyuan. Facility Planning and Design [M]. Beijing: Science Press, 2006, 47.

4   Exhibition NET — Analysis of Exhibition Design of Memorial Hall. 2017-03-11. (http://www.exhibitionnet.com/wenzhang/lunwen/2017-03-11/837.html)

5   Tong Xin: Intervention of New Media Art into Exhibition Public Space and the Reshaping Means. Master: [Master's Thesis]. Hunan University, 2012.

These device targets need to be realized by relying on new media technology.[6]

Last, the people-oriented principle should be followed all for the purpose of serving people, because the ultimate goal is to satisfy the audiences no matter how to exhibit the content.[7] Therefore, the summary is concluded and the plan is made according to the visitors' requirements by studying their mentality, so as to apply it to design. The way to exhibit design should meet the visitors' psychological pattern and behavioral habit, and this need to consider the design methods from the perspective of visitors. It is one of the essential links to redesign the innovative exhibition design methods while combining innovation and artistry on the basis of visitors' mental activity and behavioral habit.

The influence of new media technology on pupils also draws attention from family, school and society. Its characteristics, such as virtuality, interaction and openness, have impacted the traditional human view of space, and the material substance in traditional sense is replaced by virtual scene gradually. Under the influence of such life style, the requirements of exhibition space in school increase gradually, and the individuality and diversification are needed to be presented. However, such interactive exhibition form is the product of new technology and exhibition design concept, and is not mature compared with traditional exhibition design forms in school. Besides, there are few cases and practical applications which can be referred to. Some imperfect high-tech exhibition devices in the exhibition space make the new media technology unable to realize the exhibition experience design in an ideal way.

III. MORAL EDUCATION EXHIBITION SPACE DESIGN IN ELEMENTARY SCHOOLS BASED ON NEW MEDIA TECHNOLOGY

A. Interaction Between Human and Object in Moral Education Exhibition Space Design

In exhibition space design, human has to contact with objects. Not just for visitors to watch, more methods including pictures & texts and audio synchronization can be used, so that they may have a more realistic understanding of information transmission. Pross, an American designer, holds the opinion that "there are four dimensions in design, and humanity is the most important one."[8] The products or exhibition ways designed by considering visitors' feelings with humanity concept in exhibition design will be liked or accepted better. If human is regarded as the subject, people from different groups need different information, so the application of multimedia technology has expanded more spatial possibilities. There is certain regularity in people's behavioral habit and psychological performance if they are in the inherent space. As a result, the designer should grasp these behavior characteristics to deal with the relationship between human and object in exhibition space.[9] Limiting their behavior through some specific design elements and exhibition ways may help to maintain a good order of moral education exhibition space, and make sure it is a safe environmental space.

B. Planning and Design of New Media Technology in Moral Education Exhibition Space Design in Wuli Elementary School

1) Project overview

a) Location: Wuli Elementary School is located in Wuli Area, South Heiniu City Road, Hexi District, Tianjin City, having a total building area of 13,940 m^2, and it is one of the eight areas newly developed in Tianjin with emphasis ("Fig. 1"). In "Fig. 2", the yellow area is moral education exhibition space of Wuli Elementary School. This area is the main entrance of teaching building, covering an area of 280 m^2, and it is also the area to be designed in this scheme.

---

[6]   Hao Shizhong. Exhibition and Environmental Art in Information Era. South China Art Publishing House, 2007.5(1):6

[7]   Chen Jing. People-oriented Design. Master: [Master's Thesis]. Qingdao University, 2013

[8]   Docin — Exploration of Design Principles based on Three Attribute Dimensions. http://www.docin.com/p-1062097332.html.

[9]   Li Yuhua. Research on Interactive Exhibition Design under the Background of Multimedia Application [D], Tianjin Polytechnic University, 2011.
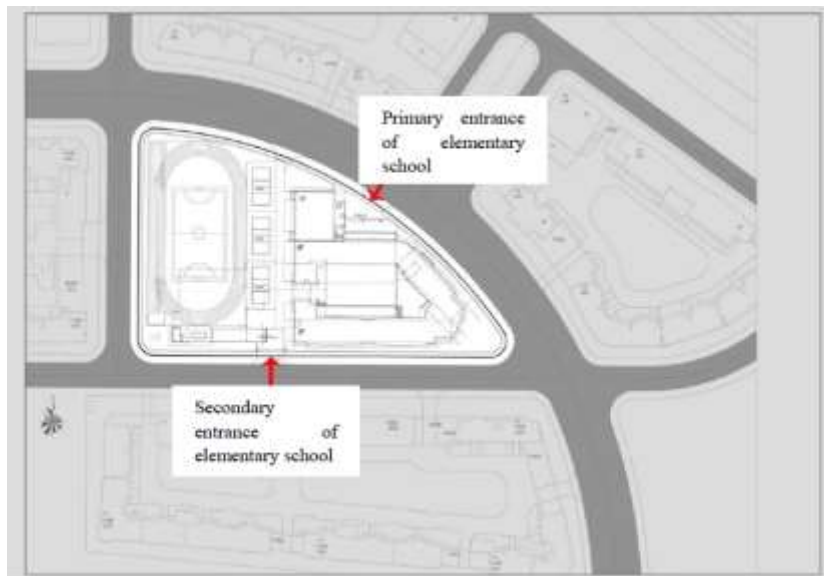
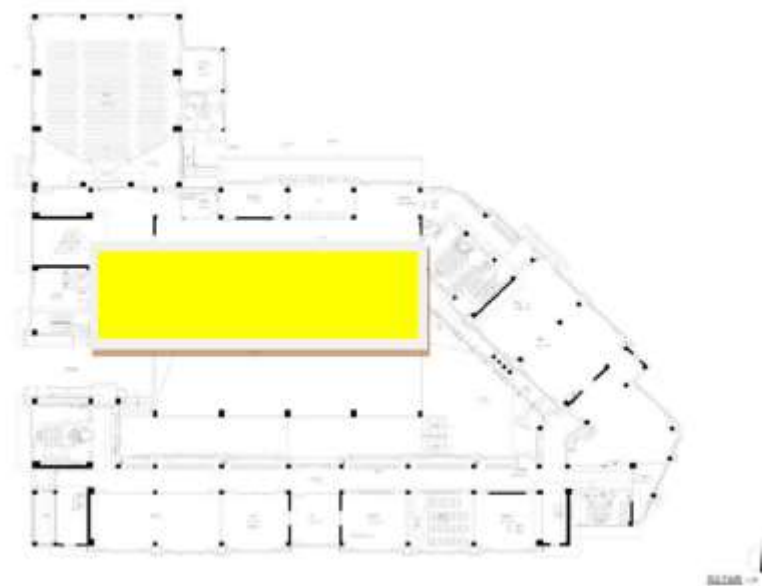Fig. 1.   Geographic location of Wuli Elementary School

Fig. 2.   General layout of buildings in Wuli Elementary School.

b) Analysis of moral education exhibition space design characteristics: In the design of moral education exhibition space in Wuli Elementary School, tangram is adopted as the design element, so as to make creation with diversified tangrams and rich colors. The exhibition form developed from this element combines with multimedia technology in exhibition space, having injected more vitality, innovation and energy into the space, enabling it to be free from the original traditional exhibition space forms, and increasing the interestingness, interactivity and participation of moral education exhibition space.

Reasonable spatial layout and smooth traffic line analysis offer the more convenient and optimized effect to the exhibition space. Appropriate new media technologies, such as, electronic book reader, large screen display, multi-touch screen technology, VR virtual reality technology and 3D projector technology, should be adopted to combine with moral education exhibition space in a better way. A new absorption pattern for children's vision has been opened, and more educational opportunities have been created for educational work by virtue of information technology. New educational mode has been developed positively, making the educational work be more of information and modern atmosphere, so that the overall quality of juveniles is enhanced constantly.

2) Summary analysis of the project: In this scheme, the "tangram" is taken as design element, and the characteristics of tangram can be seen from color selection, overall space division and the modeling of furnishings, splitting the function division by colors, making the spatial pattern clear at a glance. In addition, the area left blank is the main traffic line. The space dividing line edge in Wuli Elementary School combines with the lights, making the division more obvious and the space atmosphere of more sense of science and technology information.

From west to east of the overall space, it is a process from static to dynamic. The left area is static area, controlling the voice in the space using directional sound technology, so that the sound can only be heard within certain area without intervening the learning and visiting of other children in this area; electronic book turning technology needs a quiet atmosphere for children to read; the contents played by touch screen of tangram with human shape are also relatively simple. In the middle area, there is also multi-touch display besides large screen on the wall.

Large screen has a large area without influencing others to watch. Multi-touch display does not influence children to view the required information while using computer as its virtual interactive system has a low energy consumption and its multipoint interactive system satisfies a large number people to participate in simultaneously. In the right area, VR experience area is most important in addition to touch screen of tangram with human shape. A large space is needed to be set apart to offer enough sense of safety to children in the area while they are experiencing. Different forms of clocks and watches are placed on the wall of the classroom. One has Arabic numeral form for pupils in lower grades, and another is simple and clear with luminous function, echoing the lights in the area (see "Fig. 3").

With rich colors and unified design elements, the overall space is the product of combination of actual object and virtual technology. Appropriate application of new media technology, reasonable function division and traffic lines make the space divided and used reasonably, hoping to bring different learning experience to children.
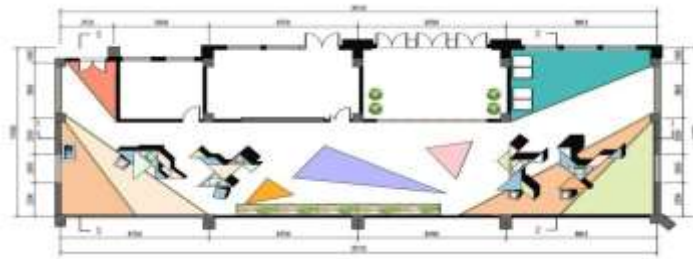

Fig. 3. Layout chart.

C. Innovative Application of New Media Technology in Moral Education Exhibition Space Design in Wuli Elementary School

1) Electronic book turning: With respect to electronic book turning system, it is to present a projected virtual book in front of the visitors, who only need to swing their hands in the air over the book to achieve the effect of turning. Visitors can choose the contents they want with it, and is also has the function of quick view, just as looking up the contents page of printing books. This is a surprise brought by virtual book turning system! Such technology offers a novel form, bringing certain visual impact to children, enabling them to obtain more knowledge.

2) VR technology: VR technology is a kind of comprehensive technology integrating computer interaction, network distribution and media information. Such technology has broken through the independent technology in traditional computer application, providing lifelike service information to people. This magical experience can be completed merely with a display screen, a pair of VR glasses, an inductor, a support frame and a pair of handles, as well as an accessible space. The using of VR technology has broadened children's horizon, enabling them to interact with each other and remember the feeling of practice, which

is beneficial to their learning of new knowledge in the play, and has reduced the learning burden to certain extent.

3) Multi-touch screen: Touch screen technology has been known by the majority of people and is widely used, and one can imagine the convenience brought by it to people. Multi-touch screen system, after upgrading on the basis of touch screen technology, allows hundred people to touch the display screen simultaneously without disturbing the information. It makes information sharing and multi-person interaction be realized. Large screen display reflects its intelligent aspect from the initial presentation to today's interactive presentation.

4) Directional sound system: Directional sound system is a device for directing the sound. It limits sound within certain scope by virtue of transmission of ultrasonic signals. People can hear what it broadcasts in the planned area, yet no sound can be heard beyond the scope. The application of such technology enables children to listen to the information they want to obtain without disturbing, playing a role of not interfering with the surroundings.

IV. CONCLUSION

New media technology develops rapidly with the arrival of information technology and integrates into people's life, being applied constantly in the field of exhibition space

design, making the original forms of exhibition space design unable to satisfy people's demand. As a result, new exhibition space design form emerges, making a breakthrough in technology application and design concept especially.

The utilization of new media technology can create an attractive and interesting space which make people feel like being personally on the scene. This is a new experience form. Experience is a way for human to perceive the surroundings and establish a situation, and also an effective method for connecting designer to audiences. In the process of expressing the situation through such form of new media art, there must be a theme. The responsibility of designer is to change such atmosphere and situation to various concrete symbols, then make them be perceived by audiences with the support of various technologies, and last, make it his own understanding and even redefine it. [10] The interaction between new media technology and art shows the integration of technology and aesthetics and reflects the richness of new exhibition space design. The interaction in multimedia technology will certainly bring a series of changes and influences to people.

REFERENCES

[1] Chen Xinghai. Character Design and Communication based on New Media Technology. Master: [Master's Thesis]. School of Design, Hunan University, 2008. (in Chinese)

[2] Scott . N . Keith . Shopping Center Design[M] . London:Van Nestrand Reinhold.1989.124

[3] Min Yuanyuan. Research and Application of Exhibition Design in the New Media Environment. Master: [Master's Thesis]. Beijing Printing Institute, 2011. (in Chinese)

[4] Steven Durland. Defining the image as place.High Performance,1987(10):37.

[5] Li Yi. Research on Application of Virtual Reality Technology in Industrial Design [D]. [Master's Thesis]. Changsha: Hunan University, 2002. (in Chinese)

[6] Wu Tao. Application of Virtual Reality Technology in Architectural Design. Engineering Design and Intelligent Building, 2002,15. (in Chinese)

[7] Zhu Yiling, Zhu Fei. Analysis of Media Technology Innovation Type — On Its Application in China's Contemporary Museum. Journal of Suzhou Art & Design Technology Institute, 2015(4):27-30 (in Chinese)

[8] Hu Zhenghua, Zhuang Changyuan. Facility Planning and Design [M]. Beijing: Science Press, 2006, 47. (in Chinese)

[9] Exhibition NET — Analysis of Exhibition Design of Memorial Hall. 2017-03-11. (in Chinese)

[10] Tong Xin: Intervention of New Media Art into Exhibition Public Space and the Reshaping Means. Master: [Master's Thesis]. Hunan University, 2012. (in Chinese)

[11] Hao Shizhong. Exhibition and Environmental Art in Information Era. South China Art Publishing House, 2007.5(1):6. (in Chinese)

[12] Chen Jing. People-oriented Design. Master: [Master's Thesis]. Qingdao University, 2013. (in Chinese)

[13] Katz E.Blumler J G.Gurevitch Utilization of Mass Communication by the individual.Resourses and Social Practice,1974,31

[14] Li Yuhua. Research on Interactive Exhibition Design under the Background of Multimedia Application [D], Tianjin Polytechnic University, 2011. (in Chinese)

[15] Zeng Wei. On the Promoting of Moral Education in Elementary Schools by Modern Educational Technology. Master: [Master's Thesis]. Sichuan Normal University, 2013. (in Chinese)

---

[10] Katz E.Blumler J G.Gurevitch Utilization of Mass Communication by the individual. Resourses and Social Practice, 1974, 31