The Influence of Technology on Modern Interior Design

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Abstract. Through the application of digital technology in the field of modern interior design space, the development of science and technology has changed the concept of interior design. The expression of intelligent design methods has penetrated into modern interior design. In this study, specific experiences from the National University BIM Design Competition will be used to analyze the use and impact of digital technology, specifically in interior design.

Key words. Modern interior design, BIM, digital technology, design contest, intelligence

1. Introduction

Along with the improvement of material life, people are expressing more requirements for the living environment. The traditional hand-painted design is difficult to meet the needs of modern interior design. Today, the digital revolution has become an unavoidable reality. In the information age, various applications are changing society life and people's living environment. Computer technology is interacting these new dynamisms arousing the enthusiasm of architects and interior designers. In response, technology has made improvements in contemporary design, providing enhanced visual views of living space. Interior design is being influenced by science and technology, especially in the areas of design, construction, and production of material. It reflects the achievements of modern technology, and the trend of simultaneous development of interior design and digital technology appears.

In this study，through the National BIM Design Competition for Universities, students participate in the interior decoration design competition. Diversified thinking, generating new design ideas, promoting new skills through competition, and exploring environmental art design. In conjunction with architecture and the requirements of decorative design project task book, use the actual application data of the competition to deeply explore the application and impact of digital technology, especially its use and impact in modern interior design. It points out the main factors of digital technology and provides solutions. The research results help university teachers and students understand digital technology and master various software functions of the

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applications. New design technology is providing improved functionality to allow virtual representations of the interior space to be seen immediately by students and teachers.

2. Characteristics of contemporary interior design and digital technology

development

In Europe: interior design history developed in the early 20th century, from the ancient Roman period to the beginning of the 20th century. With the development of digital technology in the 1960s, architects started to use computer media to create technical drawing and presentation[1]. With the introduction of newer and more powerful computers, the quality of the design applications improved in a brief period of time [1]. With the development of science and technology, and the continuous progress of information technology, the use of digital technology in interior design has become an emerging industry that occupies an important part of the global economy.

In the field of modern interior design, the consumer experience has been the focus, digital technology provides a reference point for the atmosphere of the interior space and environment.

In modern interior design, digital technology is used in the process of interior design, based on real room dimensions and virtual space layout, modeling, selection of materials, lighting, rendering, and dynamics, providing a visual representation of the indoor environment. The application and performance of digital technology have promoted the development of contemporary interior design technology. Today, new digital technology is constantly changing people's way of doing business, affecting our daily lives [2].

3. The impact of digital technology on modern interior design

3.1. S*peed and Efficiency*

Compared to traditional interior design, digital technology has many advantages, improving the efficiency of the whole process of design, production, assembly, and after-sales maintenance. It meets the requirements of modern interior design for renderings. Digital technology has improved the quality of interior design, the use of drawing software for preliminary spatial layout, and the rendering of renderings can improve efficiency by continuously optimizing and adjusting details. In some nodes, the accuracy of the structure is higher, some scientific parameters during on-site construction provide security for construction personnel; the use of digital design preserves the drawing paper, transmission and storage are more convenient; digital technology accelerates and enhances the work flow of the interior design industry, and the drawing paper is not easily lost, facilitate mutual cooperation with customers [3].

3.2. Digital technology places strict demands on designers

With the continuous upgrading of digital technology, higher requirements are put forward for interior designers. Designers need to master CAD, BIM (Building Information Modeling), Photo Shop, VR, AI, Kujiale, just to name a few of the applications available. The need to use various software to allow for flexible, aesthetic ability, which undoubtedly put forward stricter requirements for designers. The traditional hand-painted design has some disadvantages, such as low efficiency, long drawing cycle, and insufficient renderings. It was difficult to meet the needs of the customers' requirements for interior space. In today's environment, digital technology provides the advantages of high efficiency, quickness, and sustainability [4].
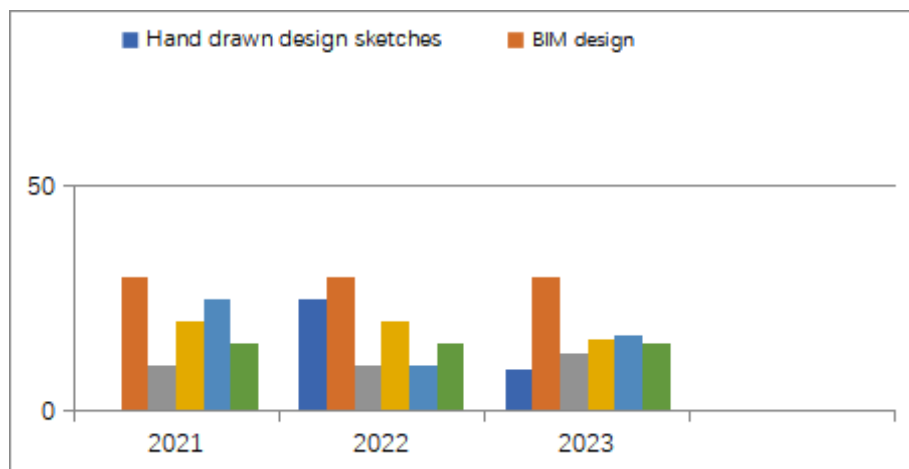
4. Digital technology and modern interior design

4.1. Analysis of Digital Technology in Decorative Design Ideas

Do you agree Today, digital technology is fully used in environmental art design? The task of the National BIM Graduation Design Competition for Universities is to express the creativity of interior design with modern interior decoration design as the carrier, based on the innovative application of BIM, virtual reality, digitalization, intelligence, and other new technologies and new models. Through the mutual promotion of the competition and the national university teaching, the purpose of promoting learning through the competition is achieved, so that participants can learn new technologies and methods and master the development trend and application of digital technology in modern interior design.

In the application of digital technology, it is not difficult to see the application module of decoration design in the whole process of BIM graduation design competition in national universities in recent years. In the task book of decoration design innovation application module in the 7th National BIM Graduation Design Competition for Universities in 2021, BIM design score of digital technology accounts for 30%, VR scheme performance score accounts for 20%, construction drawing deepening design score accounts for 25%, bill of quantities accounts for 10%, and scheme report and presentation score accounts for 15%.

In 2022, the task book of decorative design creative application module of the National BIM Graduation Competition for Universities requires that the score of hand-drawn design renderings accounts for 25%, that of BIM scheme design accounts for 30%, that of VR scheme performance accounts for 30%, and that of project scheme presentation accounts for 15%.

In 2023, the scores of hand-painted interior renderings in the task book of decorative design application module of the National BIM Graduation Competition accounted for 9%, BIM design 9%, BIM model design performance 16%, VR panorama 18%, bill of quantities preparation score 25%, construction scheme simulation score 17%, and project report presentation 15%. **Figure 1.**

Figure 1. National University BIM Design Competition in National Universities

In the last 3 years of the National Universities BIM Graduation Design Competition, the innovative of application modules has greatly improved. The innovation of new technologies and models such as intelligence, digitalization and virtual reality. The application of expressing creativity provides an effective window for the transformation and upgrading of modern interior design. The rapid development of digital technology today is impacting interior hand-painted design. Digital design will become the mainstream design method of modern interior design. From conceptual sketches to design construction drawings, from perspective representations to 3D models, the overall design process is conducive to the architect's design thinking. "Digital media is characterized by the breadth and complexity of information, the convenience and infusibility of transmission, the uniformity of coding and decoding standards and the accuracy of information exchange, etc., have advantages that traditional media cannot match" [5].

From the national university BIM graduation design competition in decorative design. A notable increase of digital technology design is seeing the quality of the design. New technologies such as intelligence, digitalization, virtual reality, and other new models are becoming more innovative. The application of creative expression provides an effective communication tool for modern interior design, transformation, and upgrading, which explains the rapid development of today's digital technology. The impact of hand-drawn interior design is worthy of our deep admiration and consideration. Future interior design, regardless of whether it is completely abandoned or retained, digital design will become the mainstream design for modern interior design. Digital media has advantages over traditional media, providing extensiveness and complexity of information. The convenience of digital media allows for seamless transmission, scalability, uniformity of decoding standards, and the accuracy of information exchange.

BIM technology serves all aspects of the entire life cycle of a construction project. BIM is an important application of digital technology in the interior design industry, allowing the realization of the entire interior design process and collaborative design

[6]. BIM technology can provide the management and coordination required by the process of interior design. This includes design, construction, and the acceptance of the final design. During the progress of a project, problems that arise during phase of the project are allowed to be seen and solve in a timely fashion. This improves the efficiency of the construction of the product. Interior design with the help of digital technology, becomes a creative and technical skill to solve the design problem [7].

4.2. The innovation of decorative design for large-scale designs

Creative VR panoramic technology decoration design and the National BIM Graduation Design Innovation Competition being held in universities, the demand has been increasing every year. With the changes in virtual reality indoor design space, VR panoramic technology has changed people's image and observation methods. With a 720 ° perspective, making people see a more realistic experience of virtual space [8]. VR is receiving increasing attention in modern interior design [9].

The application of VR panoramic technology has driven the decoration design competition to improve the quality of students and teachers, and to cultivate new professional talents for promoting new digital technology.

Using various digital technologies such as virtual reality, advanced applications, and artistry to build a humanized indoor interactive virtual display platform, accurately displaying indoor space dimensions, materials, colors, etc. [10] **Figure 2**. Virtual reality technology has promoted the development of interior design, and research in the field of interior design is for better, more scientific, and more systematic guidance. The real needs of the future development of the interior design industry are that digital means of virtual interior design provides the lowest cost and the fastest speed to explore the diversity of the design interior work scenes [11].

Figure 2. BIM first season decoration and design creativity contest

4.3. Interaction of interior and architectural design

Digitized technology in recent years, making modern interior design and architectural design a constant fusion. Through the combination of AI and VR [12], digital technology has been introduced into the traditional interior decoration and decoration industry. Modern interior design solutions are being realized. Personalization of digital technology allows models to realize high-quality interaction to see indoor space scenes. The visualization of digital design involves collecting, aggregating, integrating, and analyzing information on building exterior and interior component data, and then linking it with practical work to transform traditional hand drawn drawings into three-dimensional models, presenting the design immediately.

Modification through processing the design, and three-dimensional design to effectively combine architecture, indoor space, and environment. It provides an important direction for future smart interior design integrated transformation, starting from productization, industrialization, digitalization, standardization, and modern interior design. Digital technology is the basis and driving force that allows interior design to contribute to industrial development and improve the efficiency of traditional industries.

5. Conclusion

Through the practical application of digital technology in the national BIM design graduation competition in universities and the exploration of modern interior design digital technology and its practical performance models, the design and development of digitalization have been clarified. Through in-depth research on BIM, VR, and other software, the value and role of digital technology in the development of modern interior design technology have been fully explored, effectively promoting the development of modern interior design. Moreover, the application of BIM technology is one of the important ways to achieve digital interior design, which plays a huge role in improving the digital level of interior design and is the focus of current and future interior design research.

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