

# *Research on the training of interior design professionals under AI empowerment*

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**Abstract:** With the rapid development of science and technology, artificial intelligence (AI) technology has become a key force to promote innovation and change in many industries. In the field of interior design, AI's involvement has not only changed the way designers work, but also redefined the content and methods of professional education. Traditional interior design education faces many challenges, including the lag of educational content update, the single teaching method, and the lack of connection with the actual needs of the industry. The introduction of AI technology provides a new perspective and tool for educators to more effectively cultivate interior design talents to meet the needs of the future market. Despite the great potential of AI, its application in interior design education is still in its infancy. Most of the existing research focuses on the application of AI technology in professional practice, and the discussion on how to systematically integrate and optimize the talent training mode in the education process is relatively limited. Exploring how AI can empower the cultivation of interior design professionals not only has important theoretical value for educators and scholars, but also has practical significance for promoting the better connection between educational practice and industry needs. This paper discusses the application of AI technology in interior design education, analyzes the education mode, the teaching content and the influence of students' ability cultivation, by establishing a set of combining AI interior design education optimization strategy, expect to provide innovative perspective and methods of interior design education, and more effectively cultivate to adapt to the future technology development and market demand of design professionals.

## 1. Introduction

Interior design, as a discipline that combines art, technology and practicality, has undergone tremendous changes in the past decade. With the advancement of digital technology, from computer-aided design (CAD) to virtual reality (VR) and augmented reality (AR), new technologies have become an integral part of the designer toolbox, which not only improve the accuracy and efficiency of design, but also greatly broaden the boundaries of creativity. However, the education system with this interior design still largely relies on traditional teaching models and tools, and fails to make full use of the advantages of the latest technology, which leads to a disconnect between

education and industry needs.

## 2. New challenges and opportunities for the interior design industry

The interior design industry is facing unprecedented challenges and opportunities in the background of globalization and technological innovation. As diversified and personalized consumer needs become increasingly apparent, designers should not only create beautiful and practical space, but also consider environmental sustainability, technology integration and cultural diversity, which drive designers to have a broader knowledge system and more advanced skills.<sup>[1]</sup>With the progress of digital technology, such as 3 d printing and virtual reality is redefine the design and display, for the designer provides the creative and experimental ideas of new platform, the development of these technologies has brought the pressure on the competition, designers and design companies need to constantly learn and adapt to the new technology in order to remain competitive. The fluctuation of the global economy and the uncertainty of the market also bring certain economic pressure to the interior design industry, requiring designers to pay attention to cost effectiveness and market demand while maintaining creativity and innovation. The future of the interior design industry will be an era of technology-driven and creative integration, with both opportunities and challenges, and designers and design educators need to adjust their strategies to meet the changing market demands. As shown in Figure 1.



Figure 1: AI enabling lower interior design scheme

## 3. The potential application of AI technology in interior design education

Artificial intelligence technology is showing great potential in interior design education, and its application is not limited to the automation of the design process, but also extends to all aspects of design education. AI can help students understand the effect of spatial layout through simulation and prediction tools, and foresee the actual application effect of the design after the implementation in advance, which is a great help for students to understand the complex design concepts. AI can also support personalized learning through data analysis, adjust the teaching content and difficulty according to each student's learning progress and style, and realize customized teaching in a true sense.<sup>[2]</sup>AI application in interior design education can also enhance students' collaboration ability, through virtual cooperation platform, students can in the virtual environment with students around the world, cross-cultural and cross-regional design project, it not only expand the students' international vision, also strengthen their collaboration ability in the real work environment. The

introduction of AI technology has brought tremendous changes to interior design education, not only improving the efficiency and quality of teaching, but also providing more opportunities for students to practice and explore. As shown in Figure 2.



Figure 2: The interior design scheme by AI

## 4. Challenges of technology implementation

### 4.1 The acquisition and cost of technical resources

Although the integration of artificial intelligence technology in interior design education has its significant advantages, it often encounters the problems of resource acquisition and cost in practice. The latest AI tools and software often require significant financial investment, including purchasing software licenses, upgrading hardware facilities and maintaining the operation of systems, which is a big expense for many educational institutions.<sup>[3]</sup>Especially for small colleges with relatively tight funds, such investment limits the adoption of state-of-the-art technology. Educational institutions also need to take into account the speed of technology upgrading when introducing AI technology. The rapid growth in the AI field means that software and tools require frequent updates to maintain their effectiveness and relevance, and this continuous technology update also requires sustainable financial support. The lack of continuous financial support leads to the lag of educational institutions in technological upgrading, which further affects the quality of education and the learning effect of students. The acquisition of technical resources and its cost is a major obstacle to promoting the application of AI in interior design education, which requires careful financial planning and long-term resource management by educational institutions.

### 4.2 Technical adaptability and acceptance of teachers and students

Another major challenge to integrating AI technology into the interior design education system is the technical adaptability and acceptance of teachers and students. The introduction of AI technology has not only changed the teaching content, but also changed the teaching methods and the learning process. For teachers, they need to adapt to new teaching tools and methods, which requires them to constantly learn and update their skills to effectively use AI technology for teaching. However, not all teachers can quickly adapt to this change, and the complexity of the technology can cause some teachers to feel upset or frustrated. Students' adaptability and acceptance are equally challenging.<sup>[4]</sup>Although modern students are generally open to new technologies, the complexity and novelty of AI technologies can affect their learning motivation and effectiveness to some extent. Students need to master multiple new technologies in a short period of time, which is a challenge for students who do not have a strong technical interest or

background. The constant update of technology will make students feel unable to keep up with the pace of learning and affect their overall learning experience. The technical adaptability and acceptance of teachers and students directly affect the effective integration and promotion of AI technology in interior design education. As shown in Figure 3.

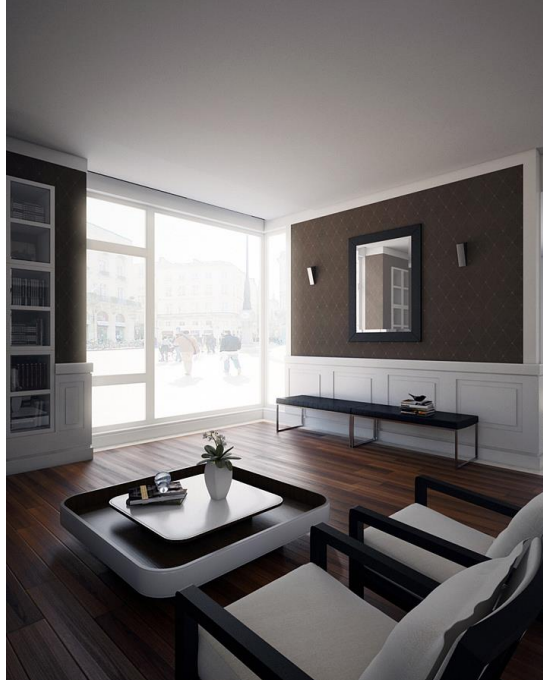


Figure 3: AI enables the lower interior design scheme

## 5. Interior design education optimization strategy under AI empowerment

### 5.1 Innovation of course content and teaching methods

#### 5.1.1 Curriculum system design integrating AI technology

In the education system of interior design major, the integration of AI technology provides a new way to construct the curriculum system, which makes the curriculum content more compatible with the contemporary design trend and technological development. The introduction of AI technology is firstly reflected in its ability to dynamically adjust the course content according to the needs of the industry. By analyzing industry trends and design cases, AI systems can help educators identify which emerging design concepts and technologies should be included in the course, and ensure the timeliness and foresight of the teaching content.<sup>[5]</sup> AI technology can also provide customized learning solutions in the students' learning process. Based on students' learning progress and understanding, the AI system can adjust the difficulty of the course, provide personalized learning resources and optimize the learning effect. AI can also provide suggestions and improvement directions through the analysis of students' design works. This real-time feedback mechanism can greatly improve students' learning motivation and design ability. Through AI technology, the curriculum system of interior design education will become more flexible and responsive, and more responsive to the needs of the rapidly changing design industry.

#### 5.1.2 Teaching application of AI tools and software

Education process AI tools and the application of software is not just a simple introduction of

technology, but a comprehensive reform of teaching and learning methods, with integration of various AI tools, such as automation design software, virtual reality (VR) and augmented reality (AR) technology, in interior design education, the application of AI tools and software is innovating the traditional teaching mode, bring unprecedented teaching and learning experience. For example, adopting automated design software, such as Stable Diffusion, can greatly improve students' design efficiency and innovation ability. Stable Diffusion is an advanced image generation tool that utilizes deep learning techniques to automatically generate high-quality images based on the user's short description. In the interior design course, teachers can guide students to use this tool to generate interior design schemes with different styles and layouts, so that students can quickly understand and master design principles and applications in practical operation. Midjourney also provides strong support for interior design education. It is an AI-based design assistant that can help designers explore and realize innovative design concepts through language instructions. In teaching, Midjourney can be used to demonstrate rapid iterations of design concepts, helping students learn how to translate abstract concepts into concrete visual output. In this way, students can see a variety of design options in a short period of time, which not only accelerates the learning process, but also stimulates students' creativity and experimental spirit. The combined application of virtual reality (VR) and augmented reality (AR) technology provides an immersive learning environment for interior design education. Using VR technology, students can "walk in" into their own design in a virtual environment, and personally experience the actual effect of spatial layout and design elements, an intuitive experience that cannot be provided by traditional graphic design drawings. AR technology allows students to stack virtual design elements in a real-world environment to better understand the relationship between design and the actual application environment. Students can operate in real time and test their design scheme, a virtual environment that not only enhances the practicality of learning, but also allows students to conduct bold and innovative experiments without the actual physical space. AI tools such as data analysis software, can help students automatically collect and analyze user data before design, forecast design trend, such data driven design method can greatly improve the rationality of design and user satisfaction, with these tools, students not only learned to use advanced technology tools, more important is to learn how to integrate science and technology elements in the design process, improve the overall quality of design and innovation. AI tools and software applications in teaching have therefore become the key to training future interior designers to gain a foothold in the technology-driven design industry.

## **5.2 Cultivation of students' skills and abilities**

### **5.2.1 Cultivation of design thinking and creativity**

In the interior design major, the cultivation of design thinking and creativity is one of the core goals of education, which requires educators to constantly explore new teaching methods to stimulate students' innovative potential. Using AI technology, this process can be effectively enhanced. AI system can simulate complex design problems, and provide a diversified solution space, make the students when exploring different design options to nonlinear thinking and multi-angle thinking, the technology support the problem solving training, not only exercise the students' creativity, also deepened their understanding of the design process. AI-assisted design software can generate a variety of design schemes based on students' initial design input, which not only provides students with intuitive learning materials, but also encourages them to critically evaluate the merits and demerits of different designs and optimize their own creation. The application of AI also helps students learn how to find and refine the most innovative and practical solutions. With such training, students can gradually form an independent design thinking mode and promote the development of the interior design industry in an innovation-driven way in their future

careers.

### **5.2.2 Strengthen the data analysis ability and technology application ability**

In the current interior design education, the enhancement of data analysis ability and technology application ability becomes particularly important, which reflects the growing market demand for designers in data-driven design decisions. The integration of AI technology provides an effective way to develop these skills, with professor how to use advanced data analysis tools, students can learn how to collect, process and explain the interior design project related big data, including user behavior data, market trend data and material performance data, these data analysis can not only help designers before the design of more accurate requirements analysis, but also can provide real-time feedback in the design process, optimize the design scheme. AI application in data analysis can also teach students how to solve complex problems through technical means, improve their ability to solve practical problems in the future workplace, with the project basic course design, students can apply in real or simulation design project these skills, data-driven design practice, such experience not only enhanced their professional skills, more laid a solid foundation for their career.

### **5.3 Adjustment of teachers' roles and teaching strategies**

#### **5.3.1 Teacher skills improvement and professional development**

In an era when artificial intelligence is increasingly becoming an integral part of interior design education, teachers' professional development and skill improvement have become the key factors for the improvement of education quality. Teachers not only need to master the traditional design theory and practical skills, more must be familiar with the latest AI technology and its application in teaching and design practice, the promotion of the skills can organize regular technical training, participate in online courses and cooperation with technology companies, with these ways, teachers can constantly update their technical knowledge base, including learning how to use the emerging AI design software, data analysis tools and virtual reality technology. We need to encourage teachers to participate in AI applications in the field of interior design research, as this can further deepen their understanding and mastery, enabling them to more effectively guide students in teaching on how to integrate AI technology to solve complex design problems. Continuous professional development not only improves teachers' own teaching and research abilities, but also creates a richer and more forward-looking learning environment for students, ensuring that educational content keeps advancing with the times.

#### **5.3.2 Enhanced teaching interaction and student participation**

In order to achieve higher student engagement and more effective learning outcomes in interior design education, the enhancement of teaching interaction is particularly important. In this process, the application of AI technology provides a variety of innovative ways to activate the classroom atmosphere and enhance students' sense of participation. Using AI-driven simulation tools and gamified learning platforms allows students to practice design concepts in an interactive and challenging environment, which not only enables students to see immediate feedback from their designs in a virtual environment, but also enhances their motivation for learning through competition and collaboration. An AI-enhanced personalized learning system is capable of dynamically adapting teaching content and difficulty levels in accordance with individual students' past learning experiences and academic achievements, thereby ensuring that each student is able to progress at their unique pace. By implementing these strategies, teachers are enabled to engage with students in a more effective manner, identify their specific needs and challenges, and subsequently

modify teaching methodologies and materials accordingly. This approach significantly enhances the relevance and effectiveness of educational practices. Furthermore, the innovative advancements in teaching methods encourage students to adopt a more proactive and exploratory approach in the learning process, fostering deeper engagement in design tasks and comprehensively bolstering their design proficiencies and innovative thinking capabilities.

## 6. Conclusion

In the current educational practice, the educational content often lags behind the latest development of the industry. Although AI and machine learning in the actual design work has begun to be applied to customer behavior analysis, space optimization, etc., but the content in the teaching course coverage is very limited, traditional teaching methods in cultivating students' innovative thinking and the ability to solve complex design problems are limitations, education institutions in the allocation of resources often failed to keep up with the pace of technology development, cause students cannot fully contact and use of cutting-edge technology. The professional education of exploring how AI can improve interior design through these channels can cultivate design talents who can adapt to future market changes and technological innovation. With the optimization of educational content, methods and tools, the improvement of education quality and the better connection between education and industry needs can be realized.

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