

Research on the Educational Reform Path of Interior Design Major in Guangdong Universities Driven by AI Technology

Xin Liu^{1*}

¹ Guangzhou College of Commerce, Guangzhou, China

Email Address

811187966@qq.com (Xin Liu)

*Correspondence: 811187966@qq.com

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Abstract:

This paper examines the educational reform pathways for interior design programs in Guangdong universities in the context of artificial intelligence technology. Through literature review, case studies, and field research, it systematically analyzes the current state of AI technology development and its impact on the interior design industry. The research reveals that AI technology is reshaping the industry's working patterns and talent requirements, while traditional teaching models struggle to adapt to these changes. In response, this paper proposes reform pathways including curriculum system restructuring, teaching method innovation, and deepening industry-education integration, along with specific implementation steps and supporting measures, providing practical references for advancing interior design education reform.

Keywords:

Artificial Intelligence, Interior Design Education, Educational Reform, Higher Education, Guangdong Universities

1. Introduction

1.1. Research Background and Significance

The rapid development of artificial intelligence technology is profoundly changing the field of design education. In recent years, with the widespread application of AI tools such as ChatGPT and Midjourney, interior design education faces new opportunities and challenges. According to the "China Artificial Intelligence Development Report 2023", China's research achievements and practical applications in the field of AI continue to grow, with significant growth in AI applications in the design field. The international design education community has made notable progress in AI and education integration. For example, Parsons School of Design has incorporated AI courses into mandatory design major curricula since 2019, pioneering the "human-machine collaborative design" teaching model. Smith's "AI-Enhanced Design Education Framework" emphasizes integrating AI tool training while maintaining creativity cultivation, while Johnson et al.'s empirical research has confirmed the positive role of AI-assisted teaching in improving learning efficiency.

Through systematic retrieval of the CNKI database (retrieval time: November 20, 2024), using the subject words “artificial intelligence” + “interior design” for analysis, it was found that since the introduction of artificial intelligence in 1978, there have been 63,133 related papers. In interior design, from the first appearance of related research in 1996 until now, the number of publications shows a significant growth trend, especially during 2020-2024, with an average annual growth rate of 47.3%. Research topics mainly focus on technical applications (38.2%), teaching reform (31.5%), talent training models (18.7%), etc. Research hotspots have evolved from AI technology cognition (2018-2020) to teaching model innovation (2021-2022), and then to industry-education integration exploration (2023-2024).

However, existing research still has issues such as theoretical discussions outweighing practical guidance, insufficient depth in AI tool application research, and the pending balance between creativity cultivation and AI application ability. This study will propose operational teaching reform plans based on actual teaching reform cases, exploring new models of industry-academia-research collaborative education under the construction of an “AI+Design” two-way integration capability training model.

2. AI Technology Development and Current Status of Interior Design Education

2.1. Overview of AI Technology Development

ChatGPT, an artificial intelligence chatbot developed by OpenAI, was officially released on November 30, 2022. Its release immediately caused a global sensation, bringing AI technology into public view. It reached 1 million users in just 5 days and exceeded 100 million users within two months, becoming the fastest-growing consumer application in history. As of December 2023, ChatGPT has approximately 180 million users, generating 1.7 billion website visits monthly. ChatGPT users are distributed globally, with U.S. users accounting for about 14.4%. According to the latest data, Chinese users account for about 18%. Beyond setting records in user numbers, it more importantly demonstrates major breakthroughs in natural language processing, sparking global discussions about AI technology development, application prospects, and potential impacts.

2.2. Analysis of Interior Design Industry Transformation

ChatGPT and AI technology have brought comprehensive innovation to the design industry. In terms of creative conceptualization, AI can quickly generate diverse design solutions and inspiration. In workflow, automation reduces repetitive work, significantly improving efficiency. Regarding tool applications, AI tools such as Midjourney, Stable Diffusion, Liblib, and DALL-E are changing traditional design processes, while mainstream design software is also integrating AI functions. These changes have transformed designers' roles from pure executors to planners and managers, with corresponding changes in skill requirements, emphasizing creative thinking, strategic thinking, and human-machine collaboration abilities. While AI reduces design costs and improves efficiency, it also brings challenges such as design homogenization and copyright issues, requiring designers to maintain unique creative perspectives and humanistic care while embracing new technology.

Claude 3.5 Sonnet defines Artificial Intelligence (AI) as: a science and technology that enables computer systems to simulate, extend, and expand human intelligence, allowing them to perceive, learn, reason, and make decisions like humans. Specifically, AI systems can continuously improve their performance through data and experience, understand and process various types of information including text, images, and sound, analyze situations, find solutions, and make reasonable judgments based on available information.

From an application perspective, AI can be divided into Narrow AI, which focuses on solving specific domain problems like image recognition and voice assistance, and General AI, which possesses human-like general intelligence capable of handling various complex tasks but remains theoretical. From a technical perspective, modern AI primarily involves systems learning and improving through data, using neural networks to simulate brain function, understanding and generating human language, and processing and comprehending visual information. Simply put, AI is technology that gives machines human-like intelligence, enabling them to learn, think, and solve problems. It is changing our way of life and affecting development across industries.

2.3. Challenges and Opportunities in Design Education

Zhang Jinbao and Li Kaiyi's research reveals misconceptions in China's AI education research status. Through phenomenological analysis of 85 highly cited papers, they identified three main issues: first, misunderstanding of teachers' roles, exaggerating AI's potential to replace teachers; second, blind optimism about changes in educational goals and methods, believing AI can achieve complete personalized education; third, unrealistic expectations for educational equity and quality improvement. The article points out that these misconceptions stem from underestimating learning process complexity, overconfidence in AI's ability to simulate human intelligence, ignoring education's social nature, and lack of objectivity due to industry-academia-research interests alignment. The article proposes recommendations from historical sociological, phenomenological, and evidence-based research perspectives, emphasizing that AI should be an auxiliary tool for educational informatization rather than a disruptive tool, requiring a more rational and practical approach to AI application in education.

Amira Fawzy Almaz's research examines AI's application as a design tool in interior design education, particularly during conceptual development. By comparing student outcomes using sufficient versus insufficient prompts for AI-generated concept images, the study found prompt quality didn't significantly affect final design results. The research shows AI tools serve more as aids than designer replacements, with success depending on designers' understanding and adaptation of AI-generated content, and ability to apply concepts to specific spaces.

Kahraman's study used Barnard's (1992) CAIDC scale to evaluate student projects across 11 design criteria including aesthetic appeal, appropriateness, and artistic value. The study involved 10 senior interior design students divided into sufficient prompt (Group A) and insufficient prompt (Group B) groups. Mann-Whitney U test results showed no significant differences between groups across all design evaluation criteria. AI tools are primarily used for concept development and visual expression stages rather than replacing designers' creative processes. Success in AI tool use depends on designers' ability to interpret and apply generated content. The study recommends integrating AI tools into interior design curricula as an essential 21st-century skill,

with conceptual analysis ability being crucial for transforming AI-generated content into practical spatial design.

3. Interior Design Education Reform Practice in Guangdong Region

3.1. Analysis of Existing Curriculum System

Curriculum system optimization is key to achieving interior design education reform in the AI era. Investigation of design institutions in Guangdong reveals that while various institutions have actively explored AI curriculum development, there are significant differences in overall planning and implementation levels. Taking the School of Art and Design at Guangdong University of Technology as an example, the school has jointly established an “AIGC Research and Learning Integration Collaborative Education Base” with Ali International, developed systematic “AI+Design” course modules, and achieved deep industry-education integration through introducing real enterprise projects. Meanwhile, the school has established design innovation laboratories providing comprehensive AI tool practice environments, forming a relatively complete practical teaching system.

In the field of vocational education, Guangdong Science and Technology Vocational College has taken more proactive reform measures. The college has mandated AI general education courses for all students starting from the class of 2025 and constructed a “1+X” certificate system incorporating AI capability certification. Through offering practical training courses in AI design tools, the college emphasizes the development of students’ digital design capabilities. This model of combining AI capability development with vocational skill certification provides valuable reference for curriculum reform in vocational institutions. The Hong Kong University of Science and Technology (Guangzhou) demonstrates an innovative model of inter-institutional cooperation, collaborating with China Academy of Art on cross-disciplinary “AI+ART” joint courses, implementing a dual mentor system to promote deep integration of technology and art, and conducting international design education cooperation projects through establishing inter-institutional joint innovation studios.

In response to these issues, this study proposes the following optimization suggestions. First, build a multi-level curriculum system, including setting up basic required AI courses, developing professional elective modules, and strengthening practical innovation courses. Second, strengthen resource integration and sharing by establishing regional teaching resource databases, promoting school-enterprise collaborative education mechanisms, and improving practice base construction. Finally, innovate evaluation methods by introducing diversified assessment approaches, establishing AI capability level evaluation systems, and emphasizing process evaluation. The implementation of these optimization measures requires institutions to advance progressively according to their characteristics and development positioning, ensuring the sustainability of reform effects.

3.2. Implementation Paths for Teaching Reform

Notably, design institutions in Guangdong are actively exploring innovative models of AI general education. This exploration demonstrates both the institutions’ forward-thinking approach to AI technology development and their proactive response to design education reform. Current practices show that while institutions have adopted different implementation paths, they all demonstrate clear reform orientations. For instance, the School of Art and Design at Guangzhou Business College has initiated

school-enterprise cooperation with Guangzhou Moyu Education Technology Co., Ltd., providing AIGC teaching training for art design faculty. The courses cover AIGC applications in architectural environmental design, visual graphic design, digital media design, and other fields. The training system adopts a progressive design, starting from basic AIGC tool operations and advancing to advanced technical applications, including ChatGPT prompt construction, Midjourney design practice, SD tool application, and ControlNet project implementation. This systematic training approach not only enhances teachers' AI application capabilities but also lays the foundation for subsequent course development.

However, publicly available specific implementation cases are still relatively limited. Many institutions are in planning or pilot stages, adopting classified teaching models with customized AI general education courses for different majors, particularly art design students. While this differentiated teaching strategy reflects respect for professional characteristics, it also presents challenges in curriculum standardization and teaching quality assessment. More institutions are expected to launch related courses by 2025, with some art schools planning to make AI general education courses mandatory.

3.3. Innovation in Industry-Education Integration

Regarding professional application courses, there is a need to strengthen AI's in-depth application in visual communication, product design, and digital media art, aligning with the Greater Bay Area's digital creative industry development needs. Innovative practical courses can leverage Guangdong's digital creative industry cluster advantages to establish practice bases with leading enterprises. For faculty development, a "dual approach" strategy is recommended - recruiting industry professionals with AI experience while systematically training existing faculty. The geographical advantage of the Greater Bay Area can be utilized to establish cross-institutional, cross-regional teacher development communities. In teaching method innovation, a "design thinking + AI empowerment" hybrid teaching model is advocated, strengthening students' practical innovation abilities through project-based learning. Finally, establishing a dynamic course evaluation mechanism incorporating AI technology application ability, innovative thinking performance, and project practice effects is recommended to form a new talent cultivation model fitting the era's characteristics.

4. Teaching Reform Effects and Prospects

Looking at the reform effectiveness, art institutions in Guangdong have made significant progress in integrating AI with design education. The School of Art and Design at Guangdong University of Technology has achieved deep industry-education integration through establishing an AIGC research and learning collaborative education base. The cross-institutional cooperation between HKUST(GZ) and China Academy of Art has created a new model of "AI+ART" joint courses, providing an exemplary case for regional collaborative development. These innovative practices have not only promoted the optimization of educational resources but also accumulated valuable experience for the digital transformation of design education in the Greater Bay Area.

However, several pressing issues have emerged during implementation. Firstly, the curriculum system is not fully mature, requiring stronger integration between AI

technology and professional courses, as existing course arrangements often remain at the tool application level, lacking systematic thinking. Secondly, faculty development faces challenges, with a relative shortage of “dual-qualified” teachers with AI application capabilities, affecting the improvement of teaching quality. Additionally, industry-academia-research collaboration mechanisms need improvement, with insufficient development of innovative practice bases, making it difficult to meet students’ needs for practical innovation ability development. The assessment system also needs updating, as traditional evaluation methods struggle to meet talent cultivation needs in the AI era, while insufficient hardware investment directly constrains the improvement of teaching effectiveness.

In response to these issues, the following optimization measures are recommended: First, build a “trinity” curriculum system leveraging the Greater Bay Area's digital creative industry cluster advantages, integrating general education courses, professional application courses, and innovative practice courses, while strengthening the depth of AI technology application in professional fields. Second, strengthen faculty development through a dual approach strategy, establishing cross-regional teacher development communities and conducting systematic AI application capability training. Meanwhile, innovate teaching methods and evaluation mechanisms by adopting a hybrid teaching model of “design thinking + AI empowerment”, establishing a diversified assessment system that emphasizes both process and outcome evaluation.

Regarding implementation, institutions are recommended to advance reforms gradually. The short-term focus (1-2 years) should be on improving infrastructure and conducting teacher training; the medium-term (2-3 years) should emphasize optimizing curriculum systems and deepening industry-education integration; and the long-term goal (3-5 years) should be building a complete AI + design education ecosystem. The implementation of these measures requires institutions to build upon their unique characteristics, through continuous practical exploration and experience summarization, to promote the digital transformation and innovative development of art and design education in the Guangdong region.

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

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