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Research on the Application of Artificial Intelligence Technology in Digital Art Design

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Abstract: The rapid iteration of artificial intelligence technology has driven the continuous innovation of digital art design and also posed a huge challenge to the traditional talent training model in the field of higher education. In the face of the challenges of cultivating applied and innovative talents in the new era, China has successively issued a series of policy documents, such as the "Artificial Intelligence Innovation Action Plan for Institutions of Higher Learning," which points out the direction for the innovative application of artificial intelligence technology in digital art design education in colleges and universities. Based on this, this article focuses on exploring the specific applications of artificial intelligence technology in digital art design education in colleges and universities, considering the current situation and real-world challenges of such education.

Keywords: Artificial intelligence technology; Digital art design; Specific applications

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1. Introduction

The rise of artificial intelligence technology has provided a new perspective and educational tools for the innovative development and in-depth reform of digital art design education in colleges and universities. Against this background, digital humanities, formed by the integrated development of artificial intelligence technology and digital art design, has not only subverted traditional art creation media and educational forms but also reshaped the aesthetic thinking of contemporary college students. Therefore, it is imperative to explore the innovative path of digital art design education in colleges and universities relying on artificial intelligence technology and to innovate the talent training model around the development of digital humanities.

2. The current situation of digital art design education in colleges and universities

2.1. Professional training objectives and core courses

Digital art design education in colleges and universities fully demonstrates the integration of modern technology, art, and education. It aims to cultivate comprehensive, compound, and innovative talents with

both an art theory foundation and digital media technology. Therefore, in the teaching of digital art design in colleges and universities, students need to master basic skills such as composition principles and color matching and then delve into the interdisciplinary knowledge derived from the integrated development of artificial intelligence technology and digital art design, such as interactive media and image processing [1]. For this reason, digital art design education in colleges and universities has offered some creative courses in combination with emerging technologies, such as the technical principles and evolutionary paths of digital humans, immersive experience design for virtual integration, and the construction of virtual space scenarios. These courses allow students to intuitively understand how artificial intelligence technology reshapes the digital art design industry and the industry's development trends, thus prompting them to develop specific and clear career development plans [2].

2.2. Limitations of the traditional talent training model

Although digital art design education in colleges and universities currently strives to highlight the subversive impact of artificial intelligence technology on the industry in talent training objectives and curriculum settings, its talent training model has not broken free from the shackles of the traditional framework and still has some problems and deficiencies. On the one hand, under the long-term influence of traditional educational concepts, some teachers focus on instilling theoretical knowledge in teaching practice and fail to cultivate students' practical innovation abilities in combination with the latest digital media technology [3]. On the other hand, the traditional teaching model of teachers lecturing and students listening is difficult to mobilize students' subjective initiative and restricts the development of their critical and innovative thinking. The existence of the above problems has led to the inefficiency of digital art design education in colleges and universities in cultivating high-quality talents to meet industry needs.

3. Real challenges faced by digital art design education

3.1. Rapid technological iteration

Under the influence of a new round of scientific and technological revolution and industrial transformation, intelligent technologies such as digital design software and production tools have emerged in an endless stream [4]. This has brought huge challenges and pressure to the innovative development of digital art design education in colleges and universities. Achieving the organic connection of the industrial chain, innovation chain, and talent chain is the fundamental guarantee for digital art design education in colleges and universities to cultivate innovative and applied talents. This means that teachers need to be market-demand-oriented, master emerging technologies, and integrate them into curriculum settings and talent training objectives to promote the precise docking of talent training with market demands [5]. However, this is not an easy task. Even if students master the latest technologies and knowledge during their college years, they may be replaced by newer technologies after graduation. For colleges and universities, maintaining the timeliness and forward-looking nature of digital art design education in the era of artificial intelligence requires investing more funds to update teaching software and equipment, which is undoubtedly a heavy economic burden. Moreover, the rapidly evolving artificial intelligence technology also places higher demands on teachers' digital literacy and digital competence. Therefore, how to balance the contradiction between technological evolution and educational lag has become an urgent issue for digital art design education in colleges and universities in the era of artificial intelligence.

3.2. Increasingly diverse and personalized student demands

The integrated development of artificial intelligence technology and the digital art design field is increasingly popular among contemporary college students. However, due to individual differences, different students have different career development plans and interests, and their expectations for courses also vary. Especially with the different course directions extended from the digital art design field, some students focus on animation design and place their learning emphasis on character modeling and scene rendering, while others focus on interactive media and attach importance to learning user interfaces and exploring new design experiences [6]. However, digital art design education in colleges and universities often uses a unified and specific teaching syllabus for curriculum setting and talent training, and its existing teaching model is difficult to meet the personalized needs of different students. In addition, due to differences in cultural and educational backgrounds, the skill levels and learning abilities of different students show obvious differences [7]. Therefore, in the face of increasingly diverse and personalized student demands, digital art design teachers in colleges and universities need to choose more flexible teaching methods and strategies.

3.3. Complex interdisciplinary integration

With the integrated development of artificial intelligence technology and digital art design, the digital art design field has been reshaped and is gradually moving from singularity and isolation to diversified development. Empowered by artificial intelligence technology, digital art design has undergone an in-depth intersection and integration with disciplines such as computer science and aesthetics, bringing unprecedented opportunities and challenges to the talent training model in the field of higher education. Traditional digital art design education often focuses on the teaching and instillation of single-subject knowledge, and this traditional training model is not conducive to cultivating students' comprehensive qualities [8]. In the face of the interdisciplinary intersection and integration brought about by artificial intelligence technology, college teachers need to skillfully embed the knowledge and skills of disciplines such as computer science into the talent training framework of digital art design education, based on bridging the digital divide. However, when introducing interdisciplinary knowledge and implementing interdisciplinary teaching, college teachers face a common problem: how to ensure the independence of each discipline while promoting the effective complementarity and organic connection between each discipline's knowledge and digital art design education. This poses a great challenge to the interdisciplinary teaching ability of college teachers and requires colleges and universities to innovate and reform the existing talent training model around interdisciplinary integration [9].

4. Specific applications of artificial intelligence technology in digital art design teaching

4.1. Enhancing artistic creativity through AI-driven tools and platforms

Artistic creativity, as a concentrated manifestation of human emotions, imagination, and cultural identity, is a unique ability that distinguishes humans from other organisms. However, with the development of artificial intelligence and its application in the field of art design, this creativity is being redefined and expanded [10]. Especially in areas such as information mining, type classification, data analysis, pattern recognition, and style transfer, AI technology provides artists with unprecedented creative tools and platforms. At the same time, AI tools also integrate knowledge and resources from the humanities field into the art design process like never before, enabling designers to explore various creative possibilities with unprecedented depth and breadth.

The application of AI technology in the field of art education, such as drawing tools like Midjourney and Stable Diffusion, has gradually become an important tool for art designers and teachers and students of art-related majors to explore creativity and improve creative efficiency. These tools can use deep-learning algorithms to automatically generate diverse artworks according to users' input keywords, styles, and other directive texts. Google has further expanded on these intelligent drawing tools, which can enhance images according to a certain style and automatically synthesize works with the same artistic style [11].

AI technology can also provide intelligent assistance at different stages of digital art design. For example, in the preliminary design stage, AI can quickly generate multiple design schemes for designers to choose from based on their initial concepts, greatly shortening the design cycle. In the in-depth design stage, AI can predict design trends by analyzing a large amount of historical data and user feedback, providing designers with design inspiration and directions. In the final presentation stage, AI can optimize the color matching, lighting effects, etc., of the work, improving the overall quality of the work.

4.2. Improving the diversity and inclusivity of digital art design education through intelligent media

The application of artificial intelligence in digital art design teaching not only enriches the tools and means of art design education but also makes the teaching content and form more diverse and inclusive [12]. The introduction of AI technologies such as virtual reality (VR), augmented reality (AR), and mixed reality (MR) breaks the dependence of the traditional education and teaching model on teaching resources and professional abilities. These technologies can simulate real or fictional scenarios to provide students with immersive creation and design experiences. While enriching students' learning experiences, they can also effectively stimulate students' creative inspiration and imagination. Students can use VR technology to explore virtual art spaces, immersive and interact with virtual objects, thus deepen their understanding and perception of art. Augmented reality (AR) technology can superimpose virtual elements on the real world. When students are engaged in design creation, they can visually see the effect of the integration of virtual and real, and this immediate visual feedback helps them better adjust and optimize the design plan. Mixed reality (MR) technology, which combines the characteristics of VR and AR, can provide more flexible and diverse interaction methods for digital art design teaching, allowing students to freely switch between the virtual and the real and further expanding the boundaries of creation.

In addition, AI technology can also rely on big-data analysis and deep learning to quickly identify and simulate diverse art forms and styles, providing students with personalized learning resources and paths. Students can choose learning content and difficulty levels suitable for them according to their interests, abilities, and needs, thus achieving more precise and efficient learning [13]. This personalized learning experience not only helps to improve students' learning effects but also stimulates their learning motivation and creativity. On this basis, AI technology can also provide customized tutoring and support for students with different backgrounds and foundations, helping them overcome learning obstacles and better integrate into the learning process of digital art design.

4.3. Promoting interdisciplinary collaboration in digital art design education through intelligent digital humanities

In the development history of art design, art design and technology have always been inseparable and complementary. Chemical pigments invented in the 19th century greatly enriched painters' color-expressing

abilities, and photography technology in the 20th century provided artists with new creative inspiration and materials. Today, the rise of artificial intelligence technology is promoting interdisciplinary collaboration in digital art design education in an unprecedented way [14]. Especially, the rise of intelligent digital humanities provides a new opportunity for the in-depth integration of art, technology, and the humanities.

Intelligent digital humanities, as a product of the interdisciplinary integration of artificial intelligence and humanities and social sciences, not only focuses on technological innovation and application but also emphasizes the exploration and inheritance of humanistic values. In digital art design education, the application of intelligent digital humanities can help students cross disciplinary boundaries and organically integrate knowledge from art, technology, history, culture, and other aspects to create digital art design works with both artistic beauty and cultural connotations. In the teaching practice of digital art design, teachers can design a series of interdisciplinary teaching projects or tasks around specific cultural themes or historical backgrounds based on a full understanding of intelligent digital humanities. They require students to use artificial intelligence technology and combine professional skills in digital media art design for creation and expression. For example, with the help of AI technology, students can digitally restore and recreate ancient murals, thus retaining the historical value of cultural relics while giving them new artistic life. In addition, students can use AI technology to conduct in-depth analyses of the art styles of different fields, historical periods, and ethnic groups, to generate digital artworks with diverse cultural connotations.

During the process of interdisciplinary collaboration, teachers can also invite experts and scholars from different disciplinary backgrounds to participate in the guidance and evaluation of digital art design teaching [15]. With their unique professional perspectives and insights, these experts and scholars can provide students with more comprehensive and in-depth academic nourishment, stimulate students' innovative thinking and practical abilities in the field of digital art design, enable students to have more solid professional skills and broader academic horizons, and lay a solid foundation for their future career development.

4. Conclusion

In conclusion, in the era of artificial intelligence, with the assistance of information technology and artificial intelligence technology, students should avoid the misunderstanding of repetitive training and devote more energy to creative conceptions and the exploration of cultural connotations. The application of artificial intelligence in digital art design education can not only enrich teaching methods but also broaden students' artistic horizons. It enables students to master professional skills in digital art design and deeply understand the cultural connotations and historical backgrounds of art design, to create digital art design works with both technological depth and cultural warmth. Based on this, teachers should face up to the opportunities and challenges brought by artificial intelligence technology to digital art design education, and through continuous exploration and practice, organically integrate artificial intelligence technology into digital art design teaching, promote the innovation and upgrading of the digital art design education model, and guide students to actively embrace new technologies, constantly update their knowledge structures and skill reserves, so that they can remain competitive in the fierce industry competition and become the vanguard force leading the development of the digital media art field.

Disclosure statement

The author declares no conflict of interest.

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