

Teaching reform and practice of digital media art specialty in colleges and universities under the background of artificial intelligence

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Abstract: With the rapid development of artificial intelligence technology, the digital media art field is facing unprecedented opportunities and challenges. The teaching reform and practice of digital media art specialty in colleges and universities have become an urgent need. This paper will discuss how to reform and innovate the teaching system of digital media art specialty in colleges and universities under the background of artificial intelligence to meet the needs of the times.

1. Introduction

Digital media art is a booming branch of contemporary art, which combines creativity and technology to create rich and diverse works of art through digital media technology. However, with the rapid development of artificial intelligence technology, digital media art is facing new challenges and opportunities. The introduction of artificial intelligence not only changed the creative way and expression form of digital media art, but also put forward new requirements for the teaching of digital media art specialty in colleges and universities.

The rapid development of artificial intelligence has caused far-reaching influence in various fields, and digital media art is no exception. Through machine learning, computer vision and natural language processing, artificial intelligence can analyze and process a large number of images, sounds and text data, providing artists with new creative tools and expressions. The application cases of artificial intelligence in digital media art include generative art, interactive art, data visualization, etc., which have created richer and more cutting-edge art forms for artists.

However, the introduction of artificial intelligence has also brought challenges to the teaching of digital media art in colleges and universities. The traditional teaching mode and content need to keep pace with the times to meet the needs of the artificial intelligence era. Teachers need to master the knowledge and technology related to artificial intelligence and be able to apply it to teaching practice. Students need to cultivate interdisciplinary ability, and at the same time have the ability to combine artistic creation with artificial intelligence technology. Therefore, the teaching of digital media art in colleges and universities needs to be reformed and innovated to adapt to the development trend of artificial intelligence era.[1-3].

2. Artificial Intelligence and Digital Media Art Teaching

2.1. The application of artificial intelligence in digital media art teaching

Artificial intelligence technology has played an important role in digital media art teaching. It not only provides new tools and expressions for artistic creation, but also provides students with broader learning fields and practical opportunities. Artificial intelligence (AI) is widely used in digital media art teaching. With the continuous development of science and technology, AI has become an important tool and resource in the field of digital media art. It can play a role in all aspects of teaching activities, including helping creativity, improving production process, enhancing learning experience and providing personalized education support. The following are some examples about the application of artificial intelligence in digital media art teaching:

(1) Generation art: Generation countermeasure network (GAN) is an artificial intelligence technology, which can generate realistic images, audio and video, as shown in Figure 1. In the teaching of digital media art, students can learn and apply GAN technology, and generate creative works by adjusting model parameters and inputs. AI can be combined with virtual reality (VR) and augmented reality (AR) to provide a richer and more immersive learning experience. Students can use AI technology to create virtual scenes, interactive elements and personas, thus expanding the creative space of digital media art. This process of generating art not only cultivates students' creativity and aesthetic consciousness, but also enables them to deeply understand the working principle of artificial intelligence algorithms.[4]. I enables creators to collaborate in digital media art projects. By sharing and analyzing data, AI can promote cooperation and communication among multiple students and improve their creative ability and teamwork ability. Although the application potential of artificial intelligence in digital media art teaching is huge, we need to pay attention to some challenges and considerations. For example, data privacy and ethical issues, technical reliability and error, and the balance of man-machine relationship all need to be seriously considered and solved (Figure 1).

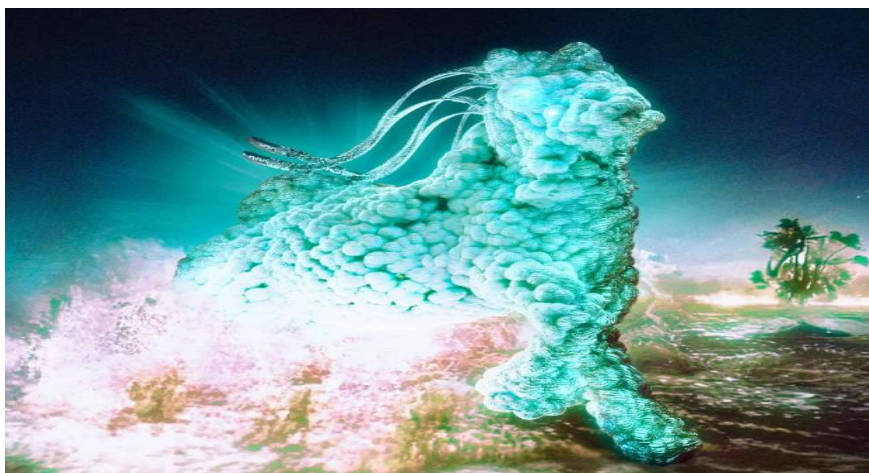


Figure 1: Generation Art

(2) Interdisciplinary cooperation: The combination of artificial intelligence and digital media art teaching promotes interdisciplinary cooperation. The creation of digital media art involves knowledge and skills in art, design, computer science and other fields. The application of artificial intelligence needs to involve algorithms, data analysis, model training and other technologies. Through interdisciplinary cooperation, students can gain knowledge and inspiration from experts and classmates in different fields and jointly complete complex and innovative digital media art projects, as shown in Figure 2.



Figure 2: Artificial Intelligence Innovative Digital Media Art Project

(3) Data visualization: Artificial intelligence technology can transform big data into a visual form, as shown in Figure 3, to help students better understand the trends and relationships behind the data. In the teaching of digital media art, students can use artificial intelligence technology to analyze and visualize data and create vivid and intuitive data art works. AI technology can help students present the complex in a visual form, making it easier to understand and analyze. This is very helpful for data collection, research and presentation in digital media art, and also cultivates students' data thinking and visualization ability. This application of data visualization not only improves students' data analysis ability, but also presents a brand-new way of information transmission for the audience. Artificial intelligence can bring many innovative applications and benefits in digital media art teaching. It provides students with broader and richer learning opportunities, expands the creative space of digital media art, and provides intelligent educational support and evaluation feedback (Figure 3).

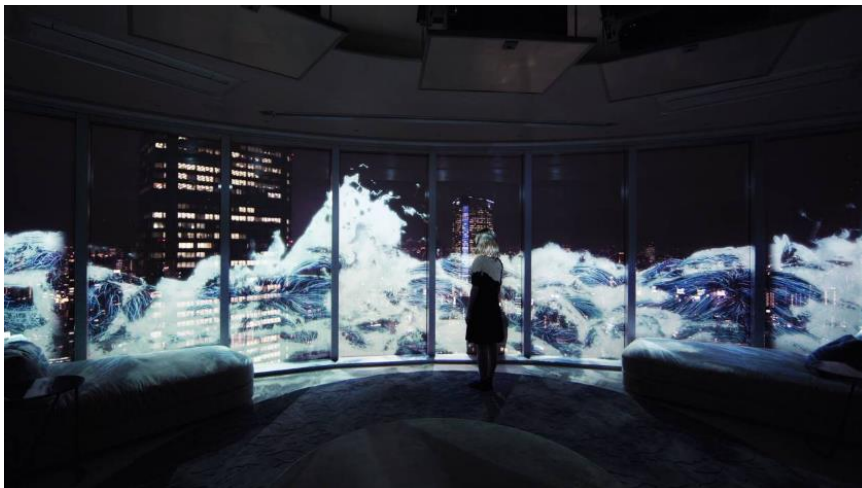


Figure 3: Data Visualization

2.2. Changes and innovations in teaching methods and contents by artificial intelligence

The introduction of artificial intelligence also puts forward new requirements and challenges to the methods and contents of digital media art teaching, and also brings innovation and change. Artificial intelligence (AI) has brought great changes and innovations to teaching methods and

contents. The rapid development of AI technology enables the education field to personalize teaching more effectively, provide richer teaching resources, improve evaluation methods and improve students' learning experience. The following are some important aspects about the changes and innovations of artificial intelligence on teaching methods and contents: The following are the changes and innovations of artificial intelligence on teaching methods and contents:

(1) Practice-oriented teaching: Traditional digital media art teaching focuses on imparting theoretical knowledge, while the introduction of artificial intelligence encourages practice-oriented teaching. Students explore and apply artificial intelligence technology by participating in practical projects and activities, so as to cultivate the ability of practical operation and problem solving. This practice-oriented teaching method can better cultivate students' creativity and practical ability and enhance their professional competitiveness.

(2) Interdisciplinary integration: The combination of artificial intelligence and digital media art teaching promotes interdisciplinary integration. Traditional digital media art teaching focuses on the knowledge and skills of art and design, while the application of artificial intelligence involves computer science, data science and other fields. Therefore, the teaching content needs to integrate the knowledge of art, design and science and technology to cultivate students' comprehensive ability and cross-disciplinary thinking mode.

(3) The change of teachers' roles: The introduction of artificial intelligence has changed teachers' roles. Teachers need not only professional knowledge and skills in the field of digital media art, but also knowledge and technology related to artificial intelligence. Teachers should act as instructors and guides for students, stimulate students' creativity and exploration spirit, and guide students to conduct in-depth research and practice in the cross field of digital media art and artificial intelligence.

(4) Personalized learning: In traditional classrooms, teachers can only teach knowledge in a collective way, which is difficult to meet the individual needs of each student. Artificial intelligence can provide customized learning routes and resources for each student by analyzing a large number of learning data and behavior patterns. AI system can adjust teaching contents and methods according to students' personal advantages, interests and learning styles, making the learning process more efficient and targeted.

(5) Learning analysis and prediction: AI technology can analyze students' learning behavior and data, and help teachers understand students' learning situation and needs. By mining learning data, AI system can measure students' learning progress and potential difficulties, and provide corresponding intervention and support. This can help teachers adjust teaching strategies in time and provide personalized learning guidance.

(6) Intelligent auxiliary teaching tools: AI technology can also provide a series of intelligent auxiliary teaching tools to help teachers better manage the classroom, design teaching activities and evaluate students. For example, teachers can use face recognition technology to monitor attendance and students' behavior, or use voice recognition and natural language processing technology to intelligently answer questions and correct compositions. These tools provide teachers with more time and energy to concentrate on teaching and activities with students.

In short, the development of I technology has also promoted cross-border cooperation and innovation between education and other fields. For example, digital media art teaching provides a richer and more immersive creative experience with the help of AI technology. Although there is great potential for artificial intelligence to change and innovate teaching methods and contents, there are also some challenges and considerations. For example, data privacy and ethical issues, technical reliability and error, and the balance of man-machine relationship all need to be seriously considered and solved. The combination of artificial intelligence and digital media art teaching has brought many new application cases and teaching methods. By studying and applying artificial intelligence technology, students can expand their creative ability and cultivate their practical ability, and make

contributions to the development and innovation of digital media art. The role of teachers has also changed, and they need to adapt to the needs of the era of artificial intelligence and become guides and motivators of students. Through this reasonable and integrated teaching mode, combining digital media art with artificial intelligence, it is expected to cultivate outstanding digital media art talents with innovative thinking and interdisciplinary ability.

3. The challenges of teaching reform under the background of artificial intelligence

3.1. Technology Update and Teacher Training

The development of artificial intelligence technology is very fast, and new algorithms and tools emerge one after another. Teachers need to constantly learn and master the latest artificial intelligence technology in order to apply it to teaching practice. However, teacher training and technology updating is a continuous and time-consuming task. Educational institutions need to provide regular training and support to ensure that teachers can keep up with the development of artificial intelligence and integrate it into digital media art teaching.[5-6].

3.2. Curriculum Design and Teaching Content Update

The application of artificial intelligence is constantly changing the demand and skill requirements of the industry. Traditional courses and teaching contents may not be able to adapt to these changes in time [7]. Therefore, educational institutions need to regularly evaluate and update the courses to ensure that the teaching content is consistent with the latest trends and technologies in the field of artificial intelligence. This also requires teachers and educational institutions to maintain close cooperation and communication with industry experts and enterprises, understand the latest industry needs, and provide students with educational content that matches the market demand [8].

3.3. Teaching resources and equipment support



Figure 4: Artificial Intelligence Teaching Equipment

Artificial intelligence teaching needs a lot of computing resources and equipment support, as

shown in Figure 4. For example, running deep learning algorithms requires high-performance computers and graphics cards [9], while virtual reality and augmented reality technology require corresponding hardware and software equipment (Figure 4). This may be a challenge for some educational institutions, because purchasing and maintaining these equipment requires considerable financial and technical support. Educational institutions need to formulate reasonable resource planning and management strategies to ensure that students can make full use of these technologies and equipment for learning and practice [10]. The application of AI technology in education is still in the stage of continuous development and exploration. In-depth research is needed to monitor and evaluate the effect and influence of AI application to ensure its quality and effect. At the same time, the participation of regulators and policymakers is needed to establish an appropriate legal and ethical framework to guide the application of AI in education [11].

4. Teaching reform and innovation

4.1. Teacher Training and Professional Development

Universities offer short-term training courses for teachers, covering the basics of AI, the introduction of algorithms and tools, and the application cases of AI in digital media art[12]. The teaching system provides online learning resources, including video tutorials, literature, and sample code, so that teachers can learn and master relevant knowledge independently[13].

(2) Universities may encourage teachers to participate in academic seminars and workshops and exchange and cooperate with experts in other fields:

The state and relevant local governments can provide financial support for faculty to participate in domestic and international academic conferences and seminars, share experiences, and exchange the latest research results with experts in other fields. Organize academic exchange activities, invite experts and scholars in the fields of artificial intelligence and digital media art to give lectures and shares, and stimulate teachers' thinking and innovation inspiration [14].

Universities can set up a team of teachers in the field of digital media art and artificial intelligence, and regularly hold teaching seminars and experience sharing sessions to promote exchanges and cooperation. Teachers are encouraged to participate in teaching research projects, jointly explore best practices in AI in digital media art teaching, and share teaching results and experiences [15].

4.2. Interdisciplinary cooperation

4.2.1. Design interdisciplinary courses and projects

(1) The college offers joint courses to organically combine knowledge in the field of digital media art and artificial intelligence to cultivate students' interdisciplinary thinking and comprehensive ability.

(2) The teaching team needs to clarify interdisciplinary projects, and students are required to work as teams to apply artificial intelligence technology to solve practical problems in the field of digital media art.

4.2.2. Carry out interdisciplinary research projects

(1) The school organizes teachers and students to participate in interdisciplinary research teams to carry out in-depth research and explore the integration and innovation of digital media art and artificial intelligence (Figure 5).



Figure 5: Developing subject courses and projects

(2) Teachers encourage students to participate in scientific research projects, provide mentorship, and cultivate students' research ability and innovative thinking.

4.2.3. Organize interdisciplinary lectures and seminars

(1) Universities can arrange special lectures and invite experts in computer science, art, artificial intelligence and other fields to share research results and practical experience.

(2) Universities can organize interdisciplinary seminars to provide a platform for exchanges and discussions between teachers and students, and promote cross-border cooperation and innovative thinking collision in different fields.

5. Explore the intersection of artificial intelligence and art

5.1. Set up specialized course modules

(1) Colleges and universities can design special courses to introduce the application and practical cases of artificial intelligence in the field of art, and guide students to think about the impact of artificial intelligence on artistic creation.

(2) The teaching team can explore the intersection of artificial intelligence technology and artistic creation, so that students can understand how to use artificial intelligence technology to create unique works of art.

5.2. Encourage students to participate in discussion and research

(1) Teachers organize group discussions or seminars for students to share their understanding and views on artificial intelligence and art, and stimulate thinking and communication.

(2) Teachers guide students to think about how AI technology can change the artistic expression, creative process, and audience of artworks.

5.3. Organization of art exhibitions and lectures

(1) Teachers can organize student art exhibitions to display digital media art works created using artificial intelligence technology, attracting the attention of schools and society.

(2) Universities can invite artists, designers and AI experts to give speeches and share their innovative practices and views on the combination of digital media art and artificial intelligence.

5.4. Practice Teaching and Project Driving

5.4.1. Design practical course items

(1) Teachers can provide practical project courses to guide students to explore the application of artificial intelligence technology in digital media art, such as using GAN to generate works of art or using machine learning algorithms for image processing.

(2) Teachers can encourage students to put forward their own ideas and projects, and deeply understand and apply the combination of artificial intelligence and digital media art through practice.

5.4.2. Encourage students to participate in cooperative projects

(1) Schools need to establish school-enterprise cooperation projects, cooperate with relevant enterprises, let students participate in actual project development, and learn how to use artificial intelligence technology to solve practical problems.

(2) The school needs to cooperate with research institutions to provide students with opportunities to participate in scientific research projects, and cultivate students' scientific research ability and innovative thinking

5.4.3. Creative collaboration and collective wisdom

AI technology provides new opportunities for collaboration and collective wisdom in artistic creation. Artists can use AI system to promote collaboration and interaction among multiple creators and create unique works of art. This form of collective wisdom can break the traditional mode of single creator of art and stimulate more creativity and ideas.

6. Conclusion

With the rapid development of artificial intelligence technology, digital media art is facing new opportunities and challenges. Artificial intelligence technology not only provides new tools and expressions for artistic creation, but also changes teaching methods and contents. In the aspect of teaching reform and innovation, a series of strategies are put forward, which can promote the cross-integration of artificial intelligence and digital media art and cultivate students' innovative ability and interdisciplinary comprehensive quality. Although artificial intelligence has brought many opportunities in the field of education, teaching reform faces some challenges when applying AI technology. These include technical preparation, training of educators, data privacy and security, ethical issues, digital divide and continuous research and supervision. By solving these challenges, we can make better use of the advantages of AI technology and promote the innovation and development of the education system.

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References

- [1] Xu Ying. *Inheritance and innovation of Chinese shadow puppetry art in digital media art teaching in colleges and universities*[J]. *International Journal of New Developments in Education*, 2022, 4. 0(8. 0).
- [2] Zhao Wei, Zhang Shuai, Li Xin. *Impact of virtual reality technology on digital media in the context of big data and artificial intelligence*[J]. *Journal of Computational Methods in Sciences and Engineering*, 2023, 23(2).
- [3] Xu Xuhui, Chen Cheng, Wei Enwei, Wang Zhenhua, Pei Huikun. *Electrical design problems and improvement countermeasures of transmission lines under the background of big data and artificial intelligence*[J]. *Journal of Computational Methods in Sciences and Engineering*, 2023, 23(1).
- [4] Xu L, Wang Z. *A Study of Practical Teaching Reform of High Frequency Electronic Circuits Course*[J]. *International Journal of New Developments in Education*, 2023, 5(14).
- [5] Jing Xian, Zhu Rongxin, Lin Jieqiong, Yu Baojun, Lu Mingming. *Education Sustainability for Intelligent Manufacturing in the Context of the New Generation of Artificial Intelligence*[J]. *Sustainability*, 2022, 14(21).
- [6] Zhang Lixia. *Application Design of Linguistics in Computer Technology under Artificial Intelligence Background*[J]. *Mobile Information Systems*, 2022.
- [7] Wang Dan. *Parameter Testing and System of Skiing Aerial Skills under the Background of Artificial Intelligence*[J]. *International Transactions on Electrical Energy Systems*, 2022.
- [8] He Wenjuan. *Automatic Error Detection Method of Embedded English Speech Teaching Recognition System under the Background of Artificial Intelligence*[J]. *Mobile Information Systems*, 2022.
- [9] Zhang Yunsheng, Meng Xiaoping. *Optimization of Self-Media Film and Television Content Production and Dissemination Paths under the Background of Artificial Intelligence* e[J]. *International Journal of Antennas and Propagation*, 2022.
- [10] Shan Pengyu, Sun Wan. *Data-Driven Winter Landscape Design and Pleasant Factor Analysis of Elderly Friendly Parks in Severe Cold Cities in Northeast China under the Background of Artificial Intelligence*[J]. *Security and Communication Networks*, 2022.
- [11] Xu Yunkai, Yu TianTian. *Visual Performance of Psychological Factors in Interior Design Under the Background of Artificial Intelligence* [J]. *Frontiers in Psychology*, 2022, 13.
- [12] Shi Lei. *Application Model Construction of Traditional Cultural Elements in Illustration Design under Artificial Intelligence Background*[J]. *Mobile Information Systems*, 2022.
- [13] Sun Zhe, Sun Peng. *Attitude Monitoring Algorithm for Volleyball Sports Training Based on Machine Learning in the Context of Artificial Intelligence*[J]. *Security and Communication Networks*, 2022.
- [14] Hao Xiumei. *Innovation in Teaching Method Using Visual Communication under the Background of Big Data and Artificial Intelligence*[J]. *Mobile Information Systems*, 2022.
- [15] Li Yi, Su Jinxia, Xiao Daiyou. *Supply Chain Financial Risk Management under the Background of Wireless Multimedia Communication and Artificial Intelligence*[J]. *Wireless Communications and Mobile Computing*, 2022.