Research on the Mechanisms of the Digital Art Talent Cultivation Mode in Colleges and Universities Based on the AIGC

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Abstract: *In the field of digital art, artificial intelligence-generated content (AIGC) technology is gradually becoming the core driving force of innovation. AIGC technology can automatically generate images, music, text and other types of artworks by simulating the creative process of human beings, providing new tools and platforms for digital art creation. Through the three methods of the literature review method, case study method, and interviews and questionnaire surveys, this paper thoroughly explores the current status of the application of AIGC in digital art education in colleges and universities, its teaching effect and its impact on the construction of teaching resources, teaching modes and evaluation systems. The research results show that AIGC technology can be used not only as a teaching tool but also as a platform to stimulate creativity and provide students with a new learning experience. Through data analysis, this paper reveals the potential of AIGC technology in enhancing students' interest in learning, creative expression, and technical mastery and proposes corresponding optimization of the teaching mode and evaluation system. In addition, this paper explores the challenges faced by AIGC technology in educational applications, such as ethical and legal issues, technological and cost challenges, insufficient faculty, and students' adaptability, and proposes corresponding countermeasures. Finally, this paper looks forward to the future development trend of AIGC in digital art education, highlights the contributions and innovations of the study, and provides references and suggestions for universities to cultivate new digital art talent in the era of AIGC.*

Keywords: AIGC, Higher Education, Talent Cultivation Model, Digital Talent, Animation Major.

1. Introduction

As a product of the cross-fertilization of art and technology, the history of digital art can be traced back to the end of the 20th century [1]. With the advancement of computer technology, the means of creating and expressing digital art have undergone a transformation from traditional digital art to intelligence and automation. The rise of AIGC technology highlights the important role of artificial intelligence in content creation, which enables computers to mimic the creative process of human beings and automatically generate works of artistic value through technologies such as deep learning and natural language processing [2]-[3]. The introduction of this technology not only changes the mode of art creation but also introduces new challenges and opportunities for art education. This study aims to explore how colleges and universities can adapt to the AIGC trend and cultivate new digital art talent [4]. The development of AIGC technology provides new tools and platforms for digital art education, which has led to significant changes in the teaching mode and talent cultivation methods. By analyzing the application of AIGC technology in digital art education, this study aims to explore how to use this technology to enhance the teaching effect and stimulate students' creative potential. In addition, this study aims to provide a reference for universities to develop a digital art curriculum system and teaching mode adapted to future industries to respond to the new demand for talent in the digital art industry [5]. This study adopts three methods: the literature review method, the case study method, and interviews and questionnaire surveys. The literature review method is used to analyze the current situation and trend of AIGC application and education research at home and abroad; the case study method uses animation majors as an example to explore the specific application of AIGC in art education; and the interview and questionnaire survey is used to collect the cognition and acceptance of AIGC from teachers and students of related colleges and universities [6] to assess the effect of the application of AIGC technology in education practice. Through these methods, this study aims to gain a comprehensive understanding of the current status of AIGC's application in digital art education, as well as its potential impact on teaching modes and talent cultivation. In the course of the study, a large amount of quantitative data and qualitative information were collected through questionnaires and interviews, which were coded and statistically analyzed to form charts and analyses, providing strong data support for this study. The results of the study are presented in the form of graphs and charts to visualize the effects and impact of AIGC technology in educational applications.

2. Basic Concepts of AIGC and Needs Analysis of Digital Arts Education

In the field of digital art education, the introduction of AIGC technology marked a revolutionary change. AIGC, or artificial intelligence-generated content (AI-generated content), involves the use of machine learning, deep learning, natural language processing and other technologies to enable computers to mimic the creative process of human beings, automatically generating works of artistic value. The development of this technology not only provides new possibilities for digital art creation but also introduces new requirements for the education model and talent training. Traditional digital art education focuses on cultivating students' manual creation skills, such as painting, sculpturing and games [7]. However, with the rise of AIGC technology, the education mode is gradually transforming to intelligence and automation. The application of AIGC technology makes the creation tools more efficient and diversified, and at the

same time, it also requires students to have a certain technical foundation and innovation ability. Therefore, the goal of digital art education in colleges and universities has also changed from pure skill cultivation to the combination of intelligent creation and technology application to meet the needs of the future industry.

2.1 Selection and use of AI tools

In digital arts education, student proficiency with AIGC tools is fundamental. This includes understanding and operating AI drawing tools such as stable diffusion, which generates images with simple cue words and supports image enhancement and style transformation. In addition, students need to learn to use AI animation generation tools, such as AI algorithms, to quickly generate complex background scenes or character motion effects, which can significantly improve the efficiency and quality of animation production [8]. For example, in the production of AI short sketches, AI technology can expand ideas, assist writing, and directly generate images and sound effects, as shown in Figure 1.

Figure 1: AI sketch generation function of the Filmora software

2.2 Training and Optimization of Creative Expression

AIGC technology provides students with a new platform for creative expression. Students can use AI technology to realize creative ideas and combine technology with artistic creation, thus broadening the flexibility and diversity of creation [9], as shown in Figure 2.
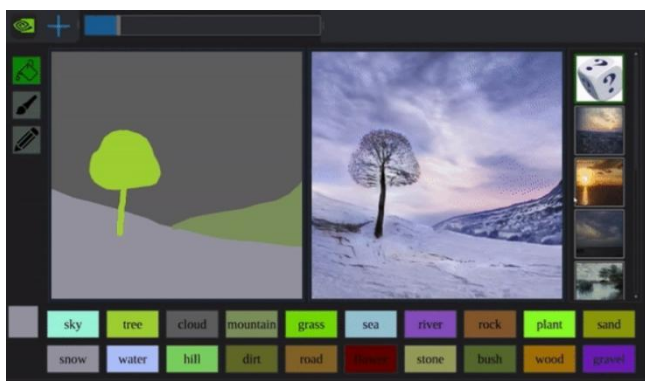
Figure 2: NVIDIA GauGAN software sketch conversion effect demonstration

For example, in animation design and production, AI technology not only provides technical support but also integrates deeply with art to create unique artistic effects. Students can explore different artistic styles and expressions through AI tools, such as using AI to simulate traditional painting styles and combining classical aesthetics with

modern technology. For example, NVIDIA released a software called GauGAN, which takes its name from the famous impressionsist painter Gauguin and is even stronger than Gauguin purely from the perspective of painting realism. The function of the software, according to the official words of NVIDIA, is "image generation on the basis of semantic layout and spatial adaptation standardization".

2.3 Teaching and Implementation of the Technology Base

To better apply AIGC techniques, students need to understand the algorithmic principles behind them, machine learning and deep learning. This includes understanding the machine learning models used in AIGC, such as supervised, unsupervised, semisupervised and reinforcement learning, as well as computer vision and natural language processing techniques. Understanding the principles of these techniques will help students better control and optimize AIGC tools and improve the technical and creative aspects of their creations. Taking animation majors as an example, the traditional animation creation process includes character design, background drawing, animation production and many other aspects, which are often time-consuming and labor-intensive [10]. The application of AIGC tools can dramatically improve the efficiency of animation creation, for example, through AI algorithms to quickly generate complex background scenes or automatically generate the dynamic effects of the character, as shown in Figure 3.

These tools not only save time and resources but also provide more creative space for creators. For example, the application of AI technology in the field of animation enables animated works to convey profound humanistic care and artistic value while maintaining technical advancement. Research to understand animation students' acceptance of AIGC and its help in creation has revealed that students generally have an open attitude toward AIGC technology, believing that it can improve the efficiency of creation and stimulate creativity [11]. Moreover, teachers believe that AIGC technology can be used as a teaching tool to help students better understand and master all aspects of animation creation. The application of this technology not only improves students' interest in creation but also provides teachers with new teaching methods and assessment tools.

Figure 3: AI-generated game characteristics and scene effects

3. Evaluation of the Effectiveness of the Application of AIGC in Digital Art Education

The evaluation of the teaching effect is an important criterion

for measuring the success of AIGC applications in digital art education. Through questionnaires, interviews and work analysis, the teaching effect of AIGC applications can be evaluated quantitatively and qualitatively [12]. Specific evaluation indices include students' learning interest, creative expression ability, and technical mastery. Through these evaluations, the effect of AIGC technology application in teaching can be understood, providing a basis for teaching improvement. This study obtains evaluation data on the application effect of AIGC in digital art education through questionnaires.

First, the experimental subjects are as follows: the target group of this questionnaire survey is 120 in-service teachers of art courses in universities. These teachers come from different regions and colleges with different teaching experiences and professional backgrounds to ensure the diversity and representativeness of the survey results. The participating teachers all have at least two years of teaching experience in the field of art education to ensure that they have sufficient understanding and practical experience in the application of AIGC technology in art education.

Second, the questionnaire process:

The questionnaire was designed by a professional educational researcher and included questions on various aspects of the use of AIGC technology in art education, such as curriculum design, creative practice, and the presentation of work for assessment.

Pretesting: Pretesting is conducted on a small scale to test the reliability and validity of the questionnaire and make necessary adjustments on the basis of the feedback.

Formal distribution: The questionnaire was formally distributed to the target group of teachers via email and online survey platforms.

Data collection: collection of completed questionnaires and data entry and collation.

Data analysis: The data collected were analyzed via statistical software, including frequency statistics and cross-tabulation analysis.

Interpretation of results: Based on the results of the data analysis, a report was written explaining the effectiveness of the use of AIGC technology in art education and feedback from teachers.

As shown in Table 1, in the questionnaire survey on the construction and teaching practices of art courses in colleges and universities, the vast majority of teachers had positive attitudes toward the application of AIGC technology. More than 79% of the teachers strongly agreed that AIGC technology significantly improved teaching efficiency and student engagement, especially in the course design and interactive learning sessions. Virtual reality applications received slightly less recognition, but 70.8% of the teachers strongly agreed with their potential to enhance student immersion and creativity. These results suggest that the use of AIGC technology in art education is widely recognized by

teachers and demonstrates its unique value and potential in several ways.

Table 1: Effectiveness of AIGC technology in the construction and teaching practices of art courses in colleges and universities

Number	Evaluation content	Application Description	Exposure to AIGC	could not agree more	agree with	neutrality	disagree	Strongly disagree.	Percentage (%)
1	emotional positivity	ChatGPT-generated evaluation content is more emotionally positive	90 per cent	100	10	5	3	2	83.3
2	Diagnosis, motivation, guidance and intervention	Applicable in providing diagnosis and guidance in academic assessment	85 per cent	108	8	2	1	1	90
3	Personalized Learning	AIGC provides personalized teaching for arts education to enhance learning experience and understanding	92 per cent	103	17	3	2	0	85.8
4	interactive	AIGC technology enhances student-teacher interaction and increases engagement and interest in learning	90 per cent	98	22	0	0	0	81.7
5	Teaching Resource Generation	AIGC technology enables automatic generation of multimodal digital resources based on teachers' needs	95 per cent	114	6	0	0	0	95
6	Virtual Assistant	AIGC technology as humanoid robots and virtual digital humans to assist and facilitate learners' artistic creation	75 per cent	90	30	0	0	0	75

Table 2: Application of AIGC technology in evaluating teaching effectiveness.

Number	Application segment	Descriptions	Exposure to AIGC	Could not agree more	Agree with	Neutrality	Disagree	Strongly disagree.	Percentage (%)
1	Programme design	Automatic generation of basic sketching templates, color schemes using AIGC technology	95 per cent	110	5	2	1	2	91.7
2	creative practice	Students use AIGC technology to create in real time and enhance the efficiency of painting creation	90 per cent	95	15	8	1	1	79.2
3	Work Evaluation Showcase	Intelligent evaluation system objectively evaluates the work, providing specific scores and suggestions for improvement	85 per cent	90	15	10	5	0	75
4	Personalized Learning	AIGC technology provides personalized learning programmes, tailoring learning to student needs	92 per cent	105	15	0	0	0	87.5
5	interactive learning	AIGC technology creates virtual learning environments that facilitate interaction and discussion between students and teachers	88 per cent	95	25	0	0	0	79.2
6	Virtual Reality Applications	Students create in digital virtual environments through virtual reality technology, realizing the infinite extension of artistic imagination	70 per cent	85	35	0	0	0	70.8

In terms of the evaluation of teaching effectiveness, the teachers highly rated AIGC technologies in terms of affective positivity and personalized learning, with 83.3% and 85.8% strongly agreeing that these technologies enhance affective positivity in evaluation and personalized experience in teaching, respectively. In addition, AIGC technologies were particularly effective at generating teaching resources, with 95% of the teachers strongly agreeing that these technologies improved the diversity and customization of teaching resources. However, in the areas of diagnosis, motivation, coaching and intervention, although 90% of teachers believed that AIGC technologies had some potential for application, a small percentage of teachers were neutral or disagreed, which may indicate that further exploration and improvement are needed in the application of AIGC technologies in these areas.

Notably, student feedback on the AIGC programme is also an important element of the evaluation. By collecting students' feedback, it is possible to understand their views and experiences of using AIGC technology, as well as the problems and difficulties they encounter in the learning process. This feedback is an important reference for optimizing the teaching content and methods. In addition, the analysis of the demand for AIGC skills in the job market is also an important aspect of the evaluation [13]. With the development of AIGC technology, there is an increasing demand for talent with AIGC skills in the job market. By

analyzing the demand of the employment market, we can understand the competitiveness enhancement of students in employment and provide guidance for colleges and universities to cultivate talent that meets the market demand.

4. Analysis of the AIGC-based Digital Art Talent Cultivation Mode in Colleges and Universities

4.1 Positioning of Talent Training Models

In the context of the digital era, the digital art industry is experiencing unprecedented changes. With the progress of technology and the diversification of market demand, the demand for digital art talent is also increasing, showing the characteristics of multiple levels and composites. As the main position of talent training, colleges and universities face the challenge of how to adapt to this trend and cultivate digital art talent that meets the needs of the times. Therefore, colleges and universities need to formulate and implement corresponding talent cultivation modes according to the needs of talent at different levels.

Colleges and universities aim to cultivate students' mastery of the basic knowledge and operational skills of AIGC tools to meet the industry's demand for basic and applied talents who can skilfully use AIGC technology. This not only requires students to understand the functions and operation of AIGC tools but also requires them to be able to flexibly use these tools in practical work to solve specific problems. The goal of talent training at the professional creation level is to train students to use AIGC technology for professional creation, such as animation, game design and other fields. The training mode of this level emphasizes the combination of creativity and technology and encourages students to master the technology while exercising their creativity to create artworks of professional standards. Students learn how to apply AIGC technology to actual artistic creations, enhancing the creativity and artistry of their work. At the highest level, colleges and universities are committed to cultivating high-end talent that can carry out innovative research and development of AIGC technology [14]. These talents should not only have a deep technical foundation but also have innovative thinking and research ability and be able to promote the integration of artistic creation and technology, leading to innovation and changes in the industry. Students are involved in the research and development of AIGC technology and in the exploration of new application areas and possibilities.

4.2 Curriculum Development

To meet the needs of talent at different levels, tertiary institutions must build a comprehensive, multilevel curriculum covering basic, creative, technical and practical courses to ensure that students can acquire the necessary knowledge and skills. The course aims to provide students with basic knowledge and operational training related to AIGC tools so that they can master and use these tools proficiently. The course content will include the working principles, operation interfaces, basic functions and common techniques of AIGC tools, etc., which will lay a solid foundation for students' subsequent professional learning.

Creative courses focus on exploring how to combine creative expression with AIGC technology, encouraging students to realize creative ideas via AI. These courses teach students how to use AIGC technology for creative thinking training and how to transform ideas into actual artwork. Students learn how to create artworks via AIGC technology to increase the creativity and individuality of their work. Technical courses provide in-depth explanations of the principles of AIGC algorithms and the basics of machine learning and deep learning, providing students with a solid technical foundation. These courses help students understand the principles behind AIGC technology and lay the foundation for future technological innovation and R&D [15]. Students will learn how to develop and optimize AIGC algorithms to improve the efficiency and effectiveness of the technology's applications. Practical courses improve students' practical skills through real project-based AIGC practices combined with project-driven teaching of industry needs. Students will participate in actual art creation projects in these courses, applying what they have learned in practice and improving their ability to solve practical problems. These courses help students understand the needs of the industry and develop their professionalism and market competitiveness.

4.3 Innovations in Teaching Models

To better adapt to the development of AIGC technology and changes in educational needs, colleges and universities need to constantly innovate their teaching models. Both online and offline teaching involve the use of AI tools with traditional hand-drawing tools to provide students with diverse learning experiences. The hybrid teaching mode aims to create a flexible and efficient learning environment through the convenience of online resources and the directness of offline interaction. Students can choose the learning mode that best suits them according to their own learning pace and style. Through project practice, students can master the application of AIGC and improve their ability to solve practical problems. The project-based teaching mode emphasizes learning through practice, allowing students to learn knowledge and skills in the process of completing specific projects and cultivating their practical ability and teamwork spirit. This teaching mode helps students better understand the value and challenges of AIGC technology in practical applications. Interdisciplinary collaboration, such as collaboration between computer science majors and art majors to work together on AI creation projects to develop students' teamwork skills, is encouraged. The collaborative teaching model promotes communication and cooperation between different disciplines and helps students develop an interdisciplinary mindset and working model to prepare for their future careers. Students learn how to function in multidisciplinary teams and how to merge knowledge from different fields to innovate.

4.4 Optimization of the Evaluation System

To assess student learning outcomes more comprehensively, universities need to optimize their evaluation systems. The evaluation system examines not only students' skill acquisition but also their creative, technical and AI application abilities. This comprehensive evaluation approach can reflect students' learning outcomes more comprehensively and encourage students to develop their abilities in multiple

areas. The evaluation system includes multiple aspects, such as coursework, project work, creative proposals, and technical reports, to ensure that the evaluation is comprehensive and fair. A dynamic evaluation mechanism including stage-by-stage feedback and continuous guidance will be established to adapt to the rapid development of AIGC technology. The dynamic evaluation mechanism can reflect students' learning progress and problems in a timely manner, provide teachers with timely feedback, and help students adjust their learning strategies in a timely manner to improve their learning results. This evaluation mechanism will pay more attention to process evaluation rather than just result evaluation to promote students' continuous development and self-improvement.

4.5 Construction of Digital Art Teaching Resources in Colleges and Universities Based on AIGC

In digital art education, the construction of teaching resources is the key to improving the quality of teaching. The development of AIGC technology provides new ideas and tools for the construction of teaching resources. Colleges and universities can enrich teaching resources and improve the interactivity and practicability of teaching by constructing AIGC resource libraries, opening resource sharing platforms and virtual simulation laboratories. Constructing an AIGC resource base is the first task of teaching resource construction. This resource library should include tutorials on the use of various AIGC tools, case studies, technical documents, etc., covering a wide range of content generation tools, such as images, videos, and audios. Through these resources, students can quickly understand and master the use of AIGC tools and provide technical support for creation. At the same time, an open resource sharing platform can be established between universities, through which universities can share their own AIGC teaching resources to achieve optimal allocation and effective use of resources [16]. The construction of a virtual simulation laboratory is an important means to improve students' practical ability. In the virtual laboratory, students can use a variety of AIGC tools to conduct online experiments and simulate the real creative process. Taking the animated profession as an example, the virtual laboratory can simulate the whole process of animation production, from character design to the generation of dynamic effects, and students can carry out practical operations in the virtual environment, which not only improves the fun of learning but also enhances the practical operation ability of students. The diversified development of teaching resources is also the key to improving teaching quality. Colleges and universities can develop online courses, such as MOOC courses, to promote the basic knowledge and technology of AIGC. These online courses can overcome the limitations of time and space and benefit more students. In addition, it is also a good way to develop experimental teaching materials through which students can systematically learn AIGC tools and applications, quickly start and apply them in their creations.

5. Prospect of AIGC Application to Digital Art Education in Colleges and Universities

While AIGC technologies present many opportunities for digital arts education, they also face a number of challenges.

First, there are ethical and legal issues, and the copyright and intellectual property issues of AIGC content generation are particularly prominent. In education, students need to be guided to correctly understand and use AIGC-generated content to avoid infringing on others' intellectual property rights [17]. In this context, colleges and universities can strengthen guidance and education for students by developing clear usage norms and educational policies. Technical and cost challenges are also issues that HEIs face. AIGC has high hardware and software requirements, which may lead to high costs that some HEIs can hardly afford [18]. To solve this problem, universities can jointly develop shared platforms and utilize cloud computing resources to reduce costs. In addition, the government and enterprises can provide financial and technical support to help colleges and universities overcome the barriers of technology and cost. AIGC education requires faculty with dual backgrounds in art and technology, which places greater demands on teachers. To solve this problem, colleges and universities can enhance teachers' professional competence through teacher training, interdisciplinary teacher cooperation and external experts. At the same time, teachers are encouraged to participate in AIGC-related research and practice to continuously update their knowledge and skills [19]. Some students may be biased or uncomfortable with AI-generated content, which requires colleges and universities to help students understand the value of AIGC creation through the curriculum and case sharing. Through actual creation practices, students can experience the convenience and innovation brought by AIGC technology, thus improving their acceptance and application of AIGC technology.

As technology continues to advance, AIGC may lead to new changes in education, such as smarter teaching tools and more personalized learning paths. These changes will have a profound impact on the art creation mode, learning mode and art market. Future research directions can focus on the far-reaching impact of technological development on digital art education and on the evolution of emerging AIGC technologies. At the same time, it is also necessary to pay attention to the ethical, legal and social issues of AIGC technology in education to ensure the healthy development and application of the technology. The application of AIGC in digital art education in colleges and universities has obvious advantages but also faces challenges. By building a talent training mode, teaching resource construction and evaluation systems adapted to the AIGC era, colleges and universities can better cultivate new digital art talent. Moreover, colleges and universities need to explore and innovate continuously to adapt to the development of AIGC technology and changes in educational needs. The aim of this study is to provide references and suggestions for colleges and universities to cultivate new digital art talent in the AIGC era and hopefully promote the future development of digital art education.

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