

# Research on AIGC technology application in digital media art creation

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**Abstract:** With the rapid development of generative AI, AIGC has reshaped the creative logic and production mode of digital media art. This study adopts a mixed method of quantitative and qualitative analysis, taking 520 artworks (2020-2025) as samples and 10 typical cases for in-depth study. The results show AIGC improves creative efficiency and enriches expressive forms but faces challenges like lack of originality and ambiguous copyright. It constructs a theoretical model, provides practical guidance, and supplements empirical research on technology-art integration.

**Keywords:** AIGC technology; digital media art; art creation; creative efficiency

## 1 Introduction

With the fast iteration of generative artificial intelligent technology, AIGC is gradually becoming an important engine to reshape the pattern of digital media art creation [1]. Digital media art is now undergoing a profound transformation in its creative logic and production mode, empowered by emerging AIGC tools such as Midjourney, Stable Diffusion and Seedance 2.0 [2]. In today's creative practices, AI-generated content (AIGC) is no longer merely a supportive tool but has evolved into a "super partner" that participates in the entire workflow of digital media art—from idea generation and visual communication to final refinement.

Researchers both at home and abroad have conducted preliminary explorations into integrating AIGC with artistic creation. Research by Kim et al. (2024) indicates that most media artists in South Korea use AIGC tools during the preparation and production stages of digital artworks, which greatly boosts creative productivity, yet often leads to a lack of originality [3]. In their study on technology empowerment in the creative industries, Guceri et al. (2019) argued that emerging digital technologies can overcome traditional barriers to creativity and realize the "technological democratization" of artistic creation [4]. However, most previous works are limited to single-case analyses or technical implementation paths, and there is a lack of systematic empirical research on the application effect and industrial impacts of AIGC across the entire domain of digital media art generation.

## 2 Research design

### 2.1 Research methods

This paper adopts a mixed-methods approach that combines quantitative empirical analysis and qualitative case study. The former employs 520 digital media artworks (including digital images, AI videos, AI art, etc.) created between 2020 and 2025 as case studies, and a comprehensive evaluation indicator system is constructed by incorporating the creative life cycle, technical application frequency, work expression dimension and audience recognition, to statistically analyze the

application effect of AIGC. The qualitative section selects 10 typical AIGC-based digital media art creation cases, including AIGC artworks from the 2026 CCTV Spring Festival Gala and the Olympic AI art collection YOUR EPIC VIBE, to conduct an in-depth investigation into the integration model and practical challenges of AIGC in artistic creation.

## 2.2 Sample selection and data sources

Study samples are selected from the official exhibition collections of international digital art festivals (e.g., Ars Electronica). Objective data—including the AIGC tools employed, the size of the creative teams, and other related information—are obtained from platform backend records and interviews with creators; in contrast, subjective evaluation data (audience recognition, artistic expression scores, etc.) are collected via expert scoring and an online audience survey (with 1,200 valid questionnaires). All data were analyzed by SPSS 26.0 for descriptive statistics and correlation analysis to ensure the scientificity and accuracy of research results.

## 2.3 Variable definition

(1) Independent variable: AIGC application level, measured by the application frequency of AIGC tools throughout the entire creative lifecycle of digital media artworks (divided into three levels: high, medium, and low).

(2) Dependent variables: Creative efficiency (measured by the actual creation cycle of the works) and expressive diversity (measured by the expressive dimensions of the works such as visual form, spatial structure and interactive mode).

(3) Control variables: Creative team scale, creator's professional background, creative theme type and creation time, which are controlled to exclude their interference on the research results.

# 3 Empirical analysis

## 3.1 Descriptive statistics

The summary statistics on the main variables used in this study are reported in Table 1.

Table 1. Descriptive statistics of core variables

Variable	COUNT	MEAN	MIN	MAX	SD
Creation cycle (days)	520	18.7	1	90	15.62
AIGC application frequency (times)	520	4.2	0	10	2.13
Expressive dimension of works	520	7.8	2	12	2.45
Audience recognition score (1-10)	520	6.9	2	10	1.85
Creative team scale (persons)	520	3.5	1	15	2.89

The number of observations (i.e., digital media artworks) is 520, covering three types, i.e., digital image (68.5%), intelligent video (21.3%) and interactive media work (10.2%). The average creation period is 18.7 days, with a standard deviation of 2.13, indicating that there are big differences in the extent to which AIGC technology has been applied to the field of digital media arts creation; and some authors still employ traditional methods to create their artworks. The mean value of the expressive dimension of the works is 7.8, with a minimum of 2 and a maximum of 12, which reflects that the application of new technologies has enriched the expressive forms of digital media art to a certain extent. The audience recognition score has a mean value of 6.9 and a standard deviation of 1.85, indicating that the audience's acceptance of AIGC-based digital media art works is generally moderate, and there are individual differences in recognition.

## 3.2 Correlation analysis

Table 2 presents the Pearson correlation analysis results between AIGC application degree, creative efficiency and expressive diversity.

Table 2. Correlation analysis of core variables

Variable	Creation cycle	AIGC application frequency	Expressive dimension	Audience recognition
Creation cycle	1.000	-0.782**	-0.215*	0.105
AIGC application frequency	-0.782**	1.000	0.654**	0.321*
Expressive dimension	-0.215*	0.654**	1.000	0.487**
Audience recognition	0.105	0.321*	0.487**	1.000
Note: *p<0.05, p<0.01				

The results show a significant negative correlation between AIGC application frequency and creative cycle ( $r=-0.782$ ,  $p<0.01$ ), indicating that higher AIGC application degree shortens the creative cycle and significantly improves creative efficiency. A significant positive correlation exists between AIGC application frequency and works' expressive dimension ( $r=0.654$ ,  $p<0.01$ ), demonstrating that AIGC enriches the expressive forms and interactive experiences of digital media art. Additionally, AIGC application frequency has a weak positive correlation with audience recognition score ( $r=0.321$ ,  $p<0.05$ ), reflecting moderate audience acceptance, which can be attributed to the lack of originality and emotional connotation in some AIGC artworks.

### 3.3 Application characteristics of AIGC in different creative stages

The frequency distribution of AIGC technology application across three main stages of the digital media art production process is shown in Figure 1: pre-production (idea generation and script planning), production (visual generation and content creation), and post-production (optimization and refinement). The results indicate that AIGC is most frequently applied in the production stage, accounting for 58.2% of total usage, mainly for image generation, artistic transformation, short film production, and related tasks.

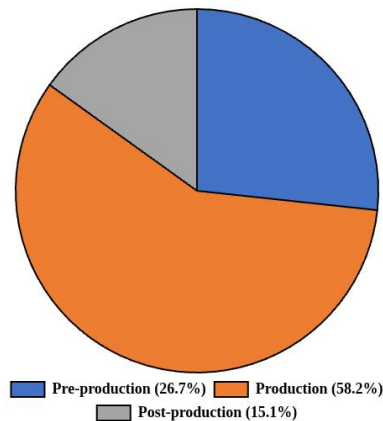


Figure 1. AIGC application frequency in different creative stages of digital media art

Its utilization rate in the pre-production stage reaches 26.7%. AIGC is mainly applied to expand creative ideas, design script frameworks, and analyze user demands, helping designers break through creative bottlenecks and enhance the rationality of their design. The post-production stage records the lowest utilization rate, at only 15.1%, where AIGC is mainly used for image retouching, sound effect matching, and interactive logic optimization. These results suggest that the application scope and depth of AIGC in post-production still need to be expanded.

## 4 Research findings and discussion

### 4.1 Core research findings

Based on empirical analysis and case study results, we draw three conclusions as follows.

First, AIGC technology expands the expressive space of cyberspace art. It breaks through the limitations of traditional art production, supports the integration of different art forms, and generates visual effects and interactive performances that are difficult to achieve manually. For instance, the AIGC virtual special effects applied in the 2026 CCTV Spring Festival Gala enabled the perfect integration of digital humans and real actors, forming the unique artistic conception of "virtual-real integration". Second, the application of AIGC faces obvious practical challenges. Currently, the use of AIGC in digital media art creation suffers from three major problems: insufficient creative originality and emotional connotation in generated works, the mismatch between AI-generated content and cultural context, and the unclear copyright ownership of AIGC works [1]. These problems lead to the low audience recognition of some AIGC works and restrict the in-depth integration of AIGC and digital media art.

#### 4.2 Discussion

Research conclusions confirm the basic assumption of this paper, i.e., AIGC technology plays a positive role in improving the creativity level and expression capacity of digital media art. The conclusion coincides with the research result of Kim et al.(2024) and Gucerı et al.(2019), and further enriches the empirical research evidence of AIGC in the field of digital media art. The "technological equalization" enabled by AIGC allows zero-based creators to produce high-quality digital media artworks. The emergence of one-person companies (OPCs) in the creative field has become a new trend in the digital cultural and creative industries [5].

However, the weak positive correlation between AIGC usage frequency and audience recognition also suggests that technology is merely a tool for artistic creation. Art is still rooted in human creative thinking and emotion. AIGC can replace human labor in technical implementation, but it is difficult to replicate the creator's unique life experience, cultural accumulation and emotional expression. This is the root cause of the "cold technological sense" and lack of artistic appeal in some AIGC-generated works. Moreover, the uncertainty of copyright ownership and the problem of plagiarism for works generated by AIGC are also major problems needing to be addressed during industrialization, which requires the joint efforts of the government, the industry and creators to formulate appropriate guidelines and standards.

### 5 Conclusion

This paper further explores the application of AIGC in digital media art creation and its comprehensive impacts on creative production and industrial development, supplementing the empirical research on the combination of digital technology and artistic creation within the disciplines of communication and fine arts. Meanwhile, it clarifies the dual effects of AIGC on digital media art production, laying a foundation for future investigations into the boundaries and rational use of AI in the artistic domain.

#### Conflicts of interest

The author declares no conflicts of interest regarding the publication of this paper.

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