Research on AI-Generated Animation-Based Digital Media Short Film Creation under Industry-Education Integration

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Abstract. With the rapid development of AI-generated content technologies, their application in digital media creation has become increasingly prominent. This paper proposes an AI-driven animation-based short film creation framework under industry-education integration, aiming to improve production efficiency and enhance practical teaching outcomes. By embedding AI tools into key stages of the creative workflow, including storyboard generation, visual content creation, and animation synthesis, the proposed method reconstructs the traditional production process. Comparative experiments show that the AI-assisted approach significantly reduces production time and improves visual quality and applicability of the works. The results demonstrate the effectiveness of combining AI technologies with industry-oriented teaching, providing a practical solution for innovation-oriented talent cultivation in digital media education.

Keywords: AI-generated content; animation production; digital media; short film creation; industry-education integration.

1 Introduction

With the rapid advancement of artificial intelligence technologies, AI-generated content has increasingly influenced the field of digital media art, particularly in animation and short film production[1][2]. Traditional digital media creation often involves time-consuming processes and high technical barriers, which limit creative efficiency and practical application in industry-oriented projects. Integrating AI-generated animation into short film creation provides new possibilities for improving production efficiency, enriching visual expression, and enhancing the alignment between education and industry needs[3].

Under the background of industry-education integration, the application of AI technologies in digital media teaching not only reshapes the creative workflow but also promotes collaborative innovation between academia and industry[4]. By embedding AI tools into the production process of promotional short films, students can engage in real-world projects while developing both technical and creative competencies. This study aims to explore an AI-driven animation creation approach and its application in

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digital media education, focusing on efficiency improvement, quality enhancement, and practical value. In this study, the term "under industry-education integration" refers to a practice-oriented educational context in which real industry projects, enterprise requirements, and academic training are systematically integrated into the creative workflow and evaluation process.

The main contributions of this paper are as follows:

1. Proposes an AI-based animation-driven short film creation framework tailored for digital media education under industry-education integration.
2. Designs a structured production workflow integrating AI tools into key stages of animation and short video creation.
3. Conducts comparative experiments to evaluate improvements in production efficiency and creative output quality.
4. Demonstrates the practical applicability of the proposed approach through real-world promotional short film projects.

2 Related Work and Research Context

2.1 AI-Generated Content in Digital Media Creation

In recent years, AI-generated content (AIGC) has been widely applied in digital media production, especially in image synthesis, animation generation, and video creation. Technologies such as generative adversarial networks (GANs) and diffusion models have significantly improved the efficiency and quality of visual content generation. Researchers have explored the use of AI tools in automating storyboard design, character generation, and animation synthesis, demonstrating their potential to reduce production time and lower technical barriers[6]. However, most existing studies focus on technical implementation, with limited discussion on their integration into systematic creative workflows.

2.2 Industry-Education Integration in Digital Media Teaching

Industry-education integration has become an important approach in cultivating applied talents in digital media and art design fields[8]. Previous studies emphasize project-based learning, studio-based teaching, and school-enterprise collaboration as effective methods to enhance students' practical abilities and innovation awareness[5]. By introducing real-world projects into the classroom, students can better align their skills with industry demands. Nevertheless, current research mainly concentrates on teaching models and collaboration mechanisms, while the role of emerging AI technologies in supporting such integration and optimizing creative processes remains insufficiently explored[7].

Despite existing studies, several gaps remain. Current research on AI-generated content mainly focuses on technical implementation, lacking integration into a complete animation production workflow. Meanwhile, studies on industry-education integration pay more attention to teaching models, with limited exploration of AI-supported practices. In addition, quantitative evaluation methods that combine

creative quality and practical applicability are still insufficient. Therefore, this study proposes an AI-driven framework to address these gaps.

3 Methodology

3.1 Framework Architecture

To address the inefficiency and limited practical alignment in traditional digital media education, this study proposes an AI-driven animation-based short film creation framework under industry-education integration, as shown in Fig. 1. The framework integrates industry requirements, AI-assisted production processes, and educational collaboration into a unified system.

The overall structure consists of three layers: input (industry-driven tasks), process (AI-enabled creative workflow), and output (short film production and application). The core AI-driven modules within the process layer are aligned with the educational layer, where script generation supports narrative design, storyboard generation enhances visual planning, animation synthesis improves technical execution, and post-production strengthens practical application skills. By embedding AI technologies into the pipeline, the framework enables a more efficient and scalable production process while maintaining creative flexibility.

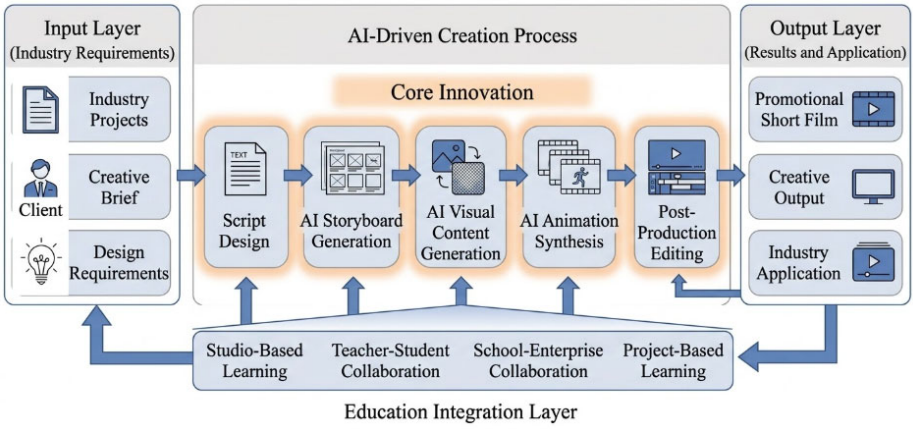

Fig. 1. AI-Driven Animation-Based Short Film Creation Framework.

3.2 AI-Driven Animation Production Process

The proposed method reconstructs the traditional short film production workflow by incorporating AI technologies into key stages, including script design, storyboard generation, visual content generation, animation synthesis, and post-production. Compared with conventional approaches, AI tools significantly reduce manual workload and accelerate content generation.

Let T_{trad} denote the time required for traditional production and T_{AI} denote the time under the proposed method. The efficiency improvement can be defined as:

$$E=\frac{T_{trad}-T_{AI}}{T_{trad}} \tag{1}$$

This formulation reflects the relative reduction in production time achieved through AI-assisted processes.

3.3 Industry-Education Integration Mechanism

To ensure practical relevance, real-world industry projects are incorporated into the teaching process as primary tasks. Students participate in project-based learning within a studio environment, guided jointly by instructors and industry mentors. This collaborative mechanism enhances both technical skills and application-oriented thinking.

The interaction between education and industry can be described as a mapping from learning input L to practical output P:

$$P = f(L, I) \tag{2}$$

where I represents industry requirements and constraints. This formulation highlights the role of external industry input in shaping learning outcomes.

3.4 Data Layer and Evaluation Metrics

To quantitatively assess the effectiveness of the proposed framework, an evaluation model is constructed from the perspectives of creative quality and practical applicability. A weighted scoring approach is adopted:

$$Q=w_1C+w_2V+w_3I+w_4A \tag{3}$$

where C, V, I, and A denote creativity, visual quality, integrity, and applicability, respectively, and w_i are the corresponding weighting coefficients. The coefficients are determined based on expert judgment from instructors and industry professionals, with w_1=0.25, w_2=0.30, w_3=0.20, and w_4=0.25, providing a structured basis for evaluating AI-assisted short film production in both educational and industry contexts.

4 Experiments and Comparative Analysis

4.1 Experimental Setup

To evaluate the effectiveness of the proposed AI-driven animation-based short film creation framework, a comparative experiment was conducted with 60 third-year undergraduate students majoring in digital media art, who had prior training in animation design, video editing, and digital content creation. The students were randomly divided into two groups: a control group using traditional methods and an experimental group using AI-assisted tools.

Both groups were assigned the same task of producing a 30–60 second promotional short film based on a real industry project brief. The experimental group used AI tools

such as diffusion-based image generation and animation synthesis, while the control group followed conventional workflows.

Evaluation data were collected from three sources: production time, expert assessment scores (three instructors and two industry professionals), and student feedback questionnaires, ensuring a reliable basis for comparative analysis.

4.2 Main Experimental Results

Production Efficiency.

The average completion time for each group was recorded throughout the project. As shown in Table 1, the experimental group using AI tools achieved a substantial reduction in production time.

Table 1. Comparison of Production Time.

Group	Average Time (hours)	Time Reduction
Traditional Group	46.5	-
AI-Based Group	27.8	40.2%

According to the efficiency model defined in Section 3, the calculated efficiency improvement E is approximately 40%, indicating that AI-assisted workflows can significantly accelerate the creation process.

Creative Quality Evaluation.

The quality of the produced short films was evaluated by five experts (three instructors and two industry professionals) using a 10-point scoring system across four dimensions. The average scores are shown in Table 2.

Table 2. Quality Evaluation Results.

Group	Creativity (C)	Visual Quality (V)	Integrity (I)	Applicability (A)	Overall Score (Q)
Traditional Group	7.4	7.1	7.6	7.2	7.33
AI-Based Group	7.6	8.3	8.0	8.1	8.00

The results show that the AI-based group improved visual quality and applicability while maintaining comparable creativity.

Student Feedback Results.

Student feedback was collected using a Likert-scale questionnaire (1–5 scale). The results indicate that:

- 86% of students agreed that AI tools improved production efficiency

- 81% reported enhanced visual expression capabilities
- 78% believed the method better aligned with industry practices

The results demonstrate that the proposed framework improves both production efficiency and practical quality in digital media short film creation.

4.3 Discussion

The results indicate that AI-assisted methods significantly improve production efficiency and visual quality, particularly in animation generation and content rendering. However, the improvement in creativity is relatively limited, suggesting that human input remains essential in conceptual design. In addition, the integration of industry projects enhances the practical relevance of student work, though it also introduces variability in task complexity. Overall, the findings support the effectiveness of combining AI technologies with industry-education integration in digital media production.

5 Conclusions and Future Work

This study proposes an AI-driven animation-based short film creation framework under industry-education integration, aiming to enhance both production efficiency and practical teaching effectiveness in digital media education. By embedding AI technologies into the creative workflow, the proposed method reconstructs the traditional production process.

Experimental results demonstrate that the framework significantly reduces production time and improves visual quality and applicability of student works. The integration of real industry projects further strengthens students' practical abilities and alignment with professional demands.

Future work will focus on optimizing AI-human collaboration mechanisms and exploring more advanced generative models to further improve creative performance and educational outcomes.

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