

Original Paper

Research on Curriculum-Ideological-Political Teaching Reform of AI-Empowered Visual Editing and Special Effects Fundamentals Integrated with Qingdao Marine Culture

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Abstract

Aiming at the prominent problems existing in video-oriented courses for digital media art majors, including heavy reliance on on-site shooting, low efficiency of classroom training, insufficient integration of local regional culture, and fragmented application of artificial intelligence, this paper takes the course Visual Editing and Special Effects Fundamentals as the carrier to construct a teaching mode characterized by “marine-culture-oriented guidance, AI-driven whole-process creation, online-offline collaborative learning, and output-oriented evaluation calibration”. Centered on Qingdao marine culture as a unified creative theme, the course transfers basic software learning to online platforms, while classroom teaching focuses on Adobe After-Effects-based special-effects production and generative-AI-supported creative practice. It reconstructs the AI-empowered video creation workflow and integrates marine history, port industry, marine science and technology, ecological civilization and other cultural resources into project-based teaching. Meanwhile, fact-checking, copyright protection and AI-ethics education are strengthened. Teaching practices indicate that the proposed teaching mode effectively reduces students' dependence on professional shooting equipment and on-site shooting conditions, improves their creative expression, professional skills and AI application capabilities, as well as their cultural identity. It realizes the organic unification of knowledge imparting, competence cultivation and value guidance, and can provide references for the teaching reform of video-related courses for digital media art majors in application-oriented universities.

Keywords

Qingdao marine culture, artificial intelligence empowerment, visual editing and special effects, curriculum-based ideological and political education, blended teaching

1. Introduction

1.1 Research Background

The Guidelines for the Construction of Curriculum-Based Ideological and Political Education in Institutions of Higher Learning issued by the Ministry of Education proposes that art-oriented courses should guide students to root themselves in the times and the people, establish correct artistic outlooks and creation concepts, and integrate value shaping, knowledge imparting and competence cultivation into the whole teaching process (Ministry of Education of the People's Republic of China, 2020). For digital media art majors, video works serve not only as outputs of technical training, but also as media for students to observe society, organize narratives and express value stances. Visual Editing and Special Effects Fundamentals integrates software operation, audio-visual narration and project production, and possesses natural conditions for implicit moral education. Nevertheless, traditional teaching usually devotes most class hours to the instruction of software tools such as Premiere Pro (PR) and Adobe After Effects (AE), and allows students to select work topics freely, which results in the separation between technical training and cultural expression.

The development of generative artificial intelligence is transforming the production mode of video content. Text, image, audio and video generation tools can participate in script conception, visual setting, shot generation, sound production and post-production optimization, and promote higher education to undergo systematic reconstruction of teaching workflows and talent-training modes from digitalized tools to systematic teaching transformation (Zhu, Dai, & Hu, 2023). Even without professional actors, studios or sophisticated equipment, students can produce audio-visual works with complete narratives. Therefore, AI should not be merely applied to storyboard sketching or “hard-to-shoot shots”; instead, it ought to function as the core production method running through course projects. Meanwhile, uncertainties of generative outputs, misinterpretation of cultural symbols, ambiguous copyright sources and deep-fake risks require teachers to incorporate technical ethics and manual review into course objectives (MIAO & HOLMES, 2023).

Qingdao originates from the ocean and thrives on maritime development. Its marine culture encompasses not only coastal landscapes, but also marine history, port industry, marine science and technology, marine ecology, coastal-defense heritage, fishery-related intangible cultural heritage and the inclusive urban spirit. Marine-culture education builds connections among knowledge cognition, emotional identification and social responsibility (Ma et al., 2022). Adopting these cultural resources as a unified course theme can avoid fragmentation of work topics, and enable students to understand the value connotations of “pursuing maritime power, embracing openness and inclusiveness, respecting nature and safeguarding our homeland” through data research, visual transformation and public communication. Accordingly, this study integrates Qingdao marine culture, AI-driven video creation and curriculum-based ideological-political education into one coherent teaching thread.

1.2 Core Concepts and Research Questions

In this paper, “AI-empowered video creation” does not mean replacing human creative judgment with tools. Instead, it embeds generative artificial intelligence into the full video-production workflow. Under teachers’ guidance, students complete humanistic research and thematic judgment, leverage large-language models for data summarization and script iteration, adopt image- and video-generation tools for visual development and dynamic-material production, and then reorganize, revise and unify generative outputs via editing and special-effects software. Humans take charge of value selection, fact-checking, aesthetic control and final authorship, while AI undertakes scheme expansion, prototype generation and repetitive production. This research addresses three main questions: First, how can Qingdao marine culture be transformed from supplementary materials into narrative foundations for projects? Second, how to reconstruct an AI-led video workflow tailored to the positioning of digital media art majors? Third, how to establish an evaluation system that balances technical performance, cultural connotation, ethics and industry adaptability?

2. Domestic and International Research Status

2.1 Domestic Research Progress

Domestic research on curriculum-based ideological-political education has evolved from conceptual interpretation to categorized discipline construction and classroom implementation. The Guidelines for the Construction of Curriculum-Based Ideological and Political Education in Institutions of Higher Learning requires in-depth exploration of ideological-political educational resources embedded in various courses to integrate value shaping, knowledge imparting and competence cultivation organically (Ministry of Education of the People’s Republic of China, 2020). In the field of art and design, relevant studies mostly start from regional culture and intangible cultural heritage through project-oriented teaching, and realize educational objectives via cultural-resource extraction, visual-element transformation and work exhibition. Regional culture provides authentic creation contexts for professional courses, and intangible-cultural-heritage resources help strengthen students’ cultural identity and inheritance awareness (Qu, 2024). However, some teaching practices remain confined to symbol collection and formal modification, with insufficient attention paid to the authenticity of cultural narratives, communication audiences and ethics of digital creation.

Research on marine-culture education is mainly distributed among marine-related majors, general education and cultural communication. Existing studies sort out marine-cultural knowledge systems from the perspective of national literacy, and emphasize the internal correlations among marine cognition, marine emotion, marine ethics and marine-oriented actions ^[3]. These achievements demonstrate that marine culture boasts interdisciplinary, visual and public-communication advantages. Nevertheless, systematic research targeting video-oriented courses for digital media art majors remains relatively limited, especially teaching models that take urban marine culture as thematic resources and complete digital-content production as teaching outputs.

As AIGC enters university classrooms, domestic research focuses shift toward teaching-resource generation, learning support, creative assistance and evaluation reform. Zhu Zhiting et al. pointed out that AIGC can not only improve content-generation efficiency, but also drive transformations in curriculum forms, teacher-student relationships and teaching workflows in higher education (Zhu, Dai, & Hu, 2023). Currently, film-television and digital-art courses have adopted large-language models, text-to-image and text-to-video tools to assist script-writing, storyboarding and conceptual design. Many practices still follow the framework of “prioritizing traditional on-site shooting with AI serving as supplementary support for special shots”. If only several tool demonstrations are added without adjusting online-class and in-class time allocation, teacher-student responsibilities and evaluation criteria, AI will easily degenerate into partial technical tricks and cannot bring about genuine teaching reform.

2.2 International Research Progress

Although there exists no concept fully equivalent to “curriculum-based ideological-political education” overseas, marine literacy, place-based education and value education also attach importance to integrating learning with community experience, ecological responsibility and public-issue discussions. The Intergovernmental Oceanographic Commission of UNESCO proposes that marine literacy requires not only understanding the interactions between oceans and human beings, but also making responsible ocean-related decisions (UNESCO - IOC, 2017). This perspective suggests that marine-themed creation should go beyond landscape consumption and respond to scientific cognition, ecological ethics and social actions simultaneously.

In terms of artificial-intelligence education research, Long and Magerko proposed that AI literacy includes understanding AI capability boundaries, recognizing the roles of data and algorithms, conducting effective human-AI collaboration, and critically evaluating AI outputs (LONG & MAGERKO, 2020). From multidisciplinary perspectives, Dwivedi et al. discussed opportunities and risks brought by generative artificial intelligence, pointing out that it facilitates content production and intellectual work while triggering risks such as misinformation, intellectual-property disputes and bias-related responsibility attribution (DWIVEDI, KSHETRI, HUGHES et al., 2023). Furthermore, UNESCO put forward people-oriented, ethical and age-appropriate principles for generative-AI application in education, emphasizing data privacy, output verification, transparent usage and teachers’ professional judgment (MIAO & HOLMES, 2023). These studies provide theoretical foundations for process documentation, manual verification and AI-usage illustration in courses.

Generally speaking, domestic research has accumulated abundant achievements in integrating curriculum-based ideological-political education, regional culture and professional teaching. International research has formed relatively complete frameworks regarding marine literacy, AI literacy and technical ethics. However, existing research outcomes have not constructed a mutually coherent curriculum structure integrating “Qingdao marine-cultural resources-full-process AI production-editing and special-effects training-value- and ethics-oriented evaluation”. Accordingly, this study incorporates

local-culture research, intelligent-content production and professional-competence cultivation into one unified project workflow.

3. Objectives and Framework of Curriculum Reform

3.1 Problem Diagnosis and Professional-Positioning Calibration

Four prominent problems existed before curriculum reform. First, the curriculum adopted the production logic for film-television directing majors, requiring students to complete actor scheduling, on-site shooting and complex-scene control, whereas digital media art students received limited training in directing, performance and photography. Second, excessive class hours within the total 64-hour curriculum were occupied by basic-software instruction, leaving compressed time for AE compositing, dynamic visuals and comprehensive creation. Third, work topics were scattered; students frequently selected familiar subjects such as game clip compilations and advertisement imitations, resulting in the lack of stable carriers for curriculum-based ideological-political education. Fourth, AI was merely used for storyboard drawings or individual shots, and generative materials failed to form coherent workflows with editing, special-effects processing and packaging.

Given the above circumstances, the curriculum redefines its professional positioning as “non-film-television-directing oriented, weakening on-site shooting, and strengthening virtual creation and AI generation”. Basic operations of PR, Jianying and partial AE functions are delivered via the Xuexitong online learning platform through video lectures, assignments and pass-rate quizzes. In-class time is mainly devoted to shot narration, core AE special-effects techniques, AI-generation control, work iteration and cultural review. On-site shooting is not completely excluded but serves as an optional material source. Students may mix and synthesize on-site-shot footage, archival materials, 3D elements and AI-generated contents according to project demands.

3.2 Ternary Objectives of “Culture-Technology-Teaching”

Knowledge objectives cover fundamental principles including editing rhythm, shot matching, mask-and-keying, tracking, compositing, color grading, sound design and packaging, as well as AI-video knowledge such as prompt-word construction, generation parameters, image-to-video transformation, and character-scene consistency. Competence objectives target complete digital-content production: students are expected to extract themes from marine-cultural resources, construct scripts and shot schemes, generate and filter materials, revise AI outputs via editing and special-effects techniques, and produce final films adapted for communication-platform distribution. Value objectives focus on marine-cultural identity, ecological responsibility, professional norms and technical ethics, enabling students to realize that “generability does not equal usability”. Works must withstand tests of factual accuracy, copyright compliance, aesthetic standards and public-value examination (LONG & MAGERKO, 2020).

3.3 Thematic Resource System for Qingdao Marine Culture

Instead of adopting broad regional classifications such as “historical memory, urban features, industrial spirit and folk intangible heritage”, curriculum resources are reorganized around marine-oriented attributes. The first category covers marine history and coastal-defense memory, including ancient-port evolution, modern coastal defense, historical facts related to the May-Fourth Movement and naval culture. The second category relates to port industry and an open-minded city, focusing on port development, shipping trade, urban openness and craftsmanship in industries. The third category involves marine science and technology and maritime-power development, selecting marine-scientific research, deep-sea exploration, marine equipment and modern marine industries. The fourth category refers to ecological civilization and blue homeland, covering coastal protection, marine litter, biodiversity and symbiosis between humans and oceans. The fifth category includes fishery customs, sea-sacrifice rituals, shell-carving and other marine-related intangible-cultural heritage and folk memories. Each category is equipped with historical-source references, keywords, visual images, discussable values and misuse reminders, to reduce direct collage of fragmented online information by students (Ma et al., 2022).

4. Implementation of the AI-Empowered Whole-Process Teaching Mode

4.1 Online Self-Learning Foundation Building and In-Class Task Restructuring

Online learning is organized in the form of “short-video tutorials + practical assignments + instant quizzes”. Before class, students finish PR timeline operations, basic editing, subtitle production and output settings, intelligent-subtitle and rapid-packaging functions of Jianying, as well as AE interface, key-frame animation and basic compositing. The learning platform records learning duration, assignment completion status and quiz results; students who fail to reach standards shall complete supplementary learning. In-class sessions avoid repetitive step-by-step software demonstrations. Instead, teaching revolves around real-world problems of marine-culture-themed projects, for instance, how to represent tidal rhythms via rhythmic variation, how to construct marine-scientific-technology interfaces through tracking and compositing, and how to unify color and spatial relationships among diverse generative shots.

4.2 Nine-Link Workflow for AI-Driven Video Creation

Course projects progress through nine consecutive links. First, cultural research. Groups select themes from marine history, science-technology, ecology or intangible heritage, establish source lists, and distinguish facts, legends and artistic imagination. Second, topic positioning. Clarify whether works target campus communication, urban cultural-tourism promotion or public-welfare advocacy, and formulate one-sentence thematic statements. Third, script design. Students independently propose structural frameworks first; large-language models are then adopted for role setting, narration compression and conflict inspection, followed by group revision and finalization. Fourth, prompt-word

formulation and visual development. Establish unified visual rules via mood boards, color schemes, character sheets and scene tables.

Fifth, AI-driven material generation. Students generate images, videos, narrations and ambient sounds according to shot lists, and record applied tools, versions, prompt-words, generation iterations and screening rationales. Manual verification against reliable references is mandatory for historical figures, landmarks and intangible-cultural-heritage craftsmanship. Sixth, editing-oriented reorganization. Generative shots frequently suffer from discontinuous motion and loose rhythm; students reconstruct narratives via shot cropping, speed adjustment, montage techniques and sound-first editing strategies. Seventh, special-effects compositing. AE is applied to realize keying, tracking, particle effects, dynamic graphics, spatial compositing and image restoration, so as to unify the audio-visual styles of AI-generated materials, archival resources and on-site-shot footage. Eighth, sound design and packaging. Complete music, sound effects, subtitles, logos and end-credit source annotations. Ninth, review and release. Teachers conduct reviews and peer-group evaluations are performed concerning factual accuracy, cultural respect, copyright compliance, AI labeling and communication effects. Revisions are completed to finalize films (DWIVEDI, KSHETRI, HUGHES et al., 2023).

4.3 Embedding Points for Curriculum-Based Ideological-Political Education

Explicit preaching sessions are excluded from curriculum-based ideological-political education, which is embedded within creative decision-making. During the research phase, students are required to trace sources of marine-cultural materials to cultivate historical-respecting and truth-seeking awareness. In the topic-setting phase, discussions are launched on relationships among marine-power strategy, ecological protection and local development, guiding students to connect individual creativity with public issues. In the generation phase, algorithmic bias, stereotyped marine imageries and fabricated historical facts are identified to clarify technical boundaries. During editing-and-special-effects processing, emphasis is laid on “technology serving morality”, preventing visual spectacles from overshadowing cultural connotations. In the release phase, AI-usage statements and material-source annotations are mandated to strengthen copyright awareness, professional responsibility and integrity-oriented expression (Ministry of Education of the People’s Republic of China, 2020).

4.4 Teachers’ Roles and Process Management

Whole-process AI-supported creation does not weaken teachers’ functions; instead, it transforms teachers from repetitive software-instruction demonstrators into project planners, cultural reviewers and creative directors. Teachers inspect prompt-word logs, material versions and revision records on a weekly basis to judge whether students have participated genuinely in creative decision-making. When generative outputs contain biological errors, mis-placed historical scenes or symbolic misuse, in-class questioning such as “where is the supporting evidence?” is organized. For technical difficulties, on-site decomposition and group consultations are adopted. Such process documentation also provides evidence for distinguishing students’ original contributions from machine-generated outputs.

5. Teaching Practice and Effect Analysis

5.1 Experimental Design

To verify the implementation effects of the proposed teaching mode, one teaching class taking the course Visual Editing and Special Effects Fundamentals for digital media-art majors was selected as the experimental subject, consisting of 30 students. The course lasted 8 weeks with 64 class hours. Students were evenly divided into 6 groups of 5 members each, balanced by professional foundations, software capabilities and collaborative competence. The experimental class adopted the teaching mode of “online autonomous learning + in-class AI-oriented creation + cultural-project practice”. Comparative analysis was conducted against the previous cohort receiving traditional on-site-shooting and post-production-oriented teaching for the same course. Both cohorts were taught by the same instructor, with consistent teaching objectives, core contents and assessment criteria; the teaching mode served as the primary variable. Data sources include course questionnaires, work scoring records, classroom observations and student interviews. Cronbach’s α coefficient was adopted to test questionnaire internal consistency, with $\alpha=0.913$ for original data. Independent-sample t-tests were applied to compare mean-value differences between the two cohorts:

$$t=(\bar{X}_1-\bar{X}_2)/\sqrt{S_1^2/n_1+S_2^2/n_2}$$

Where $\bar{X}_1$ and $\bar{X}_2$ represent mean values of the experimental class and control class respectively; and denote sample variances; and stand for sample sizes.

5.2 Teaching Case: AI-Empowered Creation of Li-Yuan Time

The short film Li-Yuan Time adopts the narrative thread of “historical memory of Li-Yuan courtyards — urban renewal — cultural inheritance”. Instead of massive on-site shooting in previous practices, its creation adopts the workflow of “AI generation + factual-data verification + supplementary partial on-site shooting”. In the preliminary project phase, students reviewed historical documents, archival videos and urban-renewal materials concerning Li-Yuan courtyards, and built historical-document tables and cultural-keyword tables. Large-language models were utilized to compare narrative schemes including chronological narration, character-centered narration and space-oriented narration for iteration of story outlines, narrations and storyboards. Cultural transformation of regional-culture elements takes both architectural forms and embedded urban-memory-related cultural values into consideration.

During material production, students adopted text-to-image and image-to-video tools to generate street views, architectural details and living-atmosphere scenes of Li-Yuan courtyards in different historical periods, with reference to historical photographs and urban archives. Manual verification was implemented for architectural forms, costumes of specific eras and historical environments; partial on-site-shot footage and publicly available archival materials were supplemented when necessary. Afterwards, shots were reorganized in Premiere Pro, and Adobe After Effects was used for

historical-photo dynamic restoration, time-space transition, light-shadow adjustment and information-graphic special-effects production. Three rounds of reviews covering script, materials and final films were set for the course. Prompt-word records, version iterations and revision logs were reserved, and AI-tool as well as reference-source explanations were added in end credits. AI undertakes major material-generation tasks, whereas thematic selection, factual judgment, shot-sequence construction and aesthetic unification are completed by students.

5.3 Teaching Effects and Reflections

Thirty valid questionnaires were collected upon course completion. Twenty-nine students (96.7 %) reported that the project deepened their understanding of Qingdao culture, and 25 students (83.3 %) stated that they proactively reflected on cultural inheritance and value expression during creation. The average score for acceptance of curriculum-based ideological-political education reached 88.5 ± 5.2 for the experimental class versus 76.8 ± 6.8 for the control class, presenting statistically significant differences ($t=3.76$, $P<0.01$). In terms of work evaluation, the experimental class achieved better performance in thematic ideological connotation and artistic creativity dimensions compared with the traditional-teaching cohort. Classroom observations demonstrate that AI-generated materials remove constraints brought by actors, venues and weather conditions, enabling students to devote more time to script-writing, shot-relationship design and visual-style unification.

Nevertheless, three types of problems emerged in practice: some students directly adopted first-round generative outputs as finished works; maintaining style and character consistency across outputs from different tools remained challenging; certain students lacked sufficient awareness of copyright compliance, data verification and AI-usage labeling. Accordingly, the course introduced the requirement of “at least three rounds of iterations”. Pre-generation visual-rule formulation, post-generation revision logs, factual-verification procedures and copyright statements were incorporated into assessment rubrics. Generative AI expands possibilities for scheme realization, yet it cannot replace cultural research, professional judgment and continuous revision. Teaching evaluation must attach importance to students’ genuine contributions and responsible AI-usage behaviors.

6. Conclusions

Within this research, Qingdao marine culture is no longer confined to scattered landmark and folk-custom symbols; instead, it functions as the core mainline unifying course topic selection, narrative construction and value judgment. Meanwhile, AI is no longer limited to storyboard sketching or production of hard-to-shoot shots, but serves as the major creation method running through script-writing, visual development, material generation, editing, special-effects processing, sound design and release. By transferring basic-software learning to online platforms and reserving in-class time for high-level creation and review, the curriculum addresses realistic constraints for digital

media-art majors, including insufficient on-site-shooting conditions, limited class hours and rapid technical updates.

Three key practical experiences are concluded from this reform. First, cultural research must precede generation, so that AI outputs can be built upon reliable knowledge and definite value stances. Second, generative materials must undergo professional reconstruction via editing and special-effects processing; the curriculum shall not degenerate into mere tool-trial activities. Third, evaluation should simultaneously cover students' personal contributions, AI-usage conditions, cultural authenticity and professional ethics. Follow-up research can conduct continuous verification across more grades and courses, improve data collection for AI-creation processes, and establish lightweight cooperation with local cultural-tourism and marine-science-popularization institutions, so that student works can obtain authentic communication feedback.

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