

Developing a Hierarchical Stepwise Teaching Scheme for AI Photographic Training in Western China's Vocational Institutes under Multi-Disciplinary Professional Group Layout

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Abstract: Generative AI and computational photography have reshaped photography teaching in vocational colleges. Traditional camera-centered courses fail to match the demands of intelligent media industries. Domestic research on AIGC photography teaching has pointed out that fragmented software training cannot form systematic vocational competency, and layered progressive curriculum design is the core path to solve teaching fragmentation in vocational colleges[1]. Based on China's "Double High-Level" professional cluster strategy, this paper constructs a four-stage progressive teaching framework for western vocational AI photography education. Adopting policy analysis, competency decomposition and curriculum mapping, the study establishes a matching logic between industrial demands, cross-major resources and students' staged growth. The four phases include visual cognition training, AI photography technical operation, hybrid creative production and industrial innovative practice. This layered framework connects basic theories, technical skills, creative design and industrial innovation while realizing cross-major resource sharing. Its smooth delivery relies on teacher training, unified intelligent platforms, process evaluation and localized industrial docking. The research provides a replicable teaching reference for western vocational schools to upgrade AI photography education.

Keywords: double high-level professional clusters; western vocational education; AI photography; hierarchical progressive teaching framework; vocational core competency

1. Introduction

AI reconstructs the whole industrial chain of visual communication, with image recognition, text-to-image generation and digital asset management becoming essential vocational skills. Media enterprises now require compound talents with operational proficiency, AI literacy, visual planning and cross-disciplinary thinking, which pushes vocational education to reform photography teaching systems. Existing domestic teaching practice shows that most vocational schools lack overall top-level design for AI photography courses, merely adding AI software operation links to traditional photography teaching without building inter-major shared competency modules [2].

Most western vocational colleges offer scattered AI photography training, treating intelligent editing tools as isolated software without systematic integration. As a shared core module for photography, digital media, design and e-commerce majors under the Double High-Level Plan, AI photography teaching must overcome local shortages of equipment and dual-qualified teachers while taking advantage of regional cultural, ecological and commercial features. Regional vocational education research emphasizes that curriculum development in western China must rely on local cultural tourism and featured agricultural industries to build situational project teaching tasks [3]. This paper proposes a targeted four-stage teaching scheme optimized for limited campus resources and regional cultural expression.

2. Theoretical Premise and Construction Principles

AI photography courses should follow cognitive development rules and fit local industrial conditions, regarding AI as a visual creation medium instead of simple auxiliary software. Given western schools' hardware limits, the framework combines professional cameras, mobile shooting gear, open-source AI tools and cloud editing platforms, guided by four core principles:

(1) Vertical layered progression: Teaching evolves from basic cognition and technical practice to integrated creation and industrial innovation. Tiered teaching logic conforms to Bloom's cognitive classification, which has been widely applied in domestic digital media curriculum design [5].

(2) Horizontal interdisciplinary synergy: Build shared competency modules to break disciplinary barriers and avoid repetitive teaching.

(3) Local industrial alignment: Take regional tourism, ecological publicity and agricultural e-commerce as real project

carriers for situational learning.

(4) Digital ethics penetration: Embed copyright rules, algorithm accountability and visual ethics into all teaching stages in line with international AI education standards.

3. Structural Layout of the Four-Stage Progressive Teaching Scheme

3.1 Stage 1: Intelligent Visual Cognition Training

This stage shapes students' basic cognition, aesthetic judgment and ethical awareness in AI visual creation. Instead of complex tool operation training, it guides learners to grasp the full lifecycle of visual works from conception, shooting, algorithm synthesis to online distribution.

(1) Core Content: Visual grammar, photography history, digital imaging basics, composition, light and color, image formats, elementary AI principles, material retrieval and visual copyright ethics.

(2) Core Competencies: Distinguish manually shot, algorithm-enhanced, hybrid and fully AI-generated images; realize AI only shifts human decision-making links while creation orientation, cultural expression and authenticity rely on human judgment; identify AI visual defects including spatial disorder, detail distortion and misleading false images.

(3) Teaching & Assessment: Adopt picture comparison, themed shooting, material classification and ethical case seminars. Evaluation focuses on visual comprehension, ethical awareness and rational selection of creation methods. This module serves as the universal foundation for all cluster majors. Domestic scholars highlight that visual literacy training must be placed at the front of all AI art courses to prevent students' over-dependence on generative models [6].

3.2 Stage 2: AI Photography Technical Operation

This phase trains standardized full-process AI photography operation abilities.

(1) Core Content: AI exposure calibration, intelligent focusing, scene recognition, photo restoration, super-resolution, automatic color grading, asset tagging and prompt-based image generation.

(2) Core Competencies: Follow industrial pipelines of demand analysis, tool selection, image generation, quality inspection and standardized delivery; prioritize efficient, copyright-compliant technical schemes rather than mechanical software memorization.

(3) Resource Integration: Combine physical shooting studios with free open-source AI software and cloud computing to compensate insufficient hardware. Resource hybrid allocation is a mature solution summarized from the intelligent photography teaching practice of western regional vocational colleges [4].

3.3 Stage 3: Integrated Creative Production

Based on Stage 2 technical capacity, this module integrates photography, generative AI, post-production, visual design and cross-media communication.

(1) Core Content: Multimodal creation, hybrid human-AI workflow design, visual storytelling, prompt optimization and full-process digital copyright management.

(2) Core Competencies: Choose camera shooting, pure AI generation or hybrid production according to creative positioning; archive prompt iteration records, material sources and copyright authorization certificates.

(3) Synergy Mechanism: Stage 2 and 3 advance synchronously: technical abilities expand creative boundaries while complex creation tasks expose technical deficiencies; shared modules reduce repeated software training and boost interdisciplinary collaboration. The "technology-creativity" two-way interactive teaching model has been verified effective in domestic AIGC photography workshop teaching [1].

3.4 Stage 4: Industrial Innovative Application

This stage cultivates students' ability to solve real industrial problems and adapt to emerging media posts through multi-disciplinary project coordination and commercial innovation.

(1) Core Content: Visual project planning, workflow optimization, full-lifecycle digital asset management, industrial quality standards and intellectual property risk control.

(2) Core Competencies: Shift from single-image creators to designers of complete visual solution packages; analyze client demands, customize exclusive AI workflows, predict operational risks and evaluate user experience. Innovation is measured by industrial practicability, cultural matching and audience recognition instead of superficial technological novelty.

(3) Regional Practice: Connect training projects with local cultural tourism promotion, regional brand building, ecological publicity and agricultural e-commerce photography. Localized industrial project docking is the key to narrowing the

gap between vocational teaching and enterprise posts in western China [2].

4. Curriculum Organization within Double High-Level Professional Clusters

4.1 Construction of Universal and Specialized Competency Matrix

Interdisciplinary clusters require transparent competency matrices matching industrial tasks, vocational abilities, teaching modules and assessment benchmarks.

Table 1. Shared and Specialized Competency Matrix for Interdisciplinary Digital-Visual Professional Clusters

Matrix Category	Target Competencies	Associated Subjects / Modules
Shared Competencies	Visual cognition, basic AI logic, digital image processing, copyright regulations, introductory prompt writing, data management, teamwork	Intelligent Visual Cognition, Basic Photography Theory, Digital Imaging Fundamentals
Specialized Competencies	Commercial photography, brand visual design, prompt-based style adjustment, digital narrative, regional cultural visual communication	Advanced Commercial Photography, Visual Brand Planning, Cross-Media Digital Storytelling

The matrix eliminates repeated teaching content and clarifies course boundaries, with dynamic updates responding to technical iteration, industrial standards and local market changes. Building unified competency matrix for professional clusters is the core requirement of national “Double High-Level” vocational college construction [7].

4.2 Modularization and Progressive Logical Connection of Courses

Four sequential module groups correspond to the four training stages: [Foundation Modules] —► [Technical Modules] —► [Integration Modules] —► [Innovation Modules] (Visual Cognition Training) (AI Operational Tools) (Hybrid Creative Production) (Industrial Practical Projects)

Task difficulty complies with Bloom’s cognitive taxonomy:

- Beginner: Reproduce standard visual works following step-by-step guides
- Intermediate: Complete independent project creation with self-selected tools and workflows
- Advanced: Finish open commercial projects including demand communication, customized workflow design and post-project reflection

AI knowledge is embedded into existing courses such as studio lighting and graduation practice rather than developing independent new software courses. Separately setting up AI software courses will lead to disconnection between theory and practice, which is a common problem summarized from domestic photography major teaching reform cases [3].

4.3 Integration of Teaching, Competition, Certification and Production

The framework unifies classroom teaching, skill training, vocational certifications, skill contests and commercial creation. Competition rules cannot override core teaching objectives of critical thinking and cultural creation despite improving operational speed and teamwork. All commercial shooting tasks are standardized teaching projects with clear learning goals and reflective archives. Shared practical platforms with studios, editing workstations and cloud resources improve cross-major resource utilization.

5. Implementation Path and Teaching Quality Assurance System

5.1 Interdisciplinary Faculty Cultivation and Teaching Resource Construction

Schools need collaborative teaching teams of photography, design and IT teachers to balance visual creation and AI technology capabilities. Teacher training covers human-AI workflow design, prompt writing, digital asset governance, AI ethics and process evaluation. Modular, updatable teaching packages include task sheets, prompt logs, workflow diagrams and ethical checklists for convenient content iteration. Domestic research points out that the shortage of dual-qualified teachers mastering both photography and AI is the primary bottleneck restricting AI photography teaching in western vocational colleges[4].

5.2 Multi-Dimensional Full-Process Formative Assessment

Layered assessment standards matching four training phases:

- Stage 1: Visual analysis, theoretical mastery and ethical risk identification
- Stage 2: Operational accuracy, workflow efficiency and reasonable tool selection

- Stage 3: Creative coherence, human-AI collaboration and cross-media adaptability
- Stage 4: Industrial problem-solving, project management, risk control and professional reflection

Process archives (demand briefs, raw materials, prompt logs, editing records, copyright documents and reflection statements) are mandatory because final AI works cannot reflect individual labor. Process-oriented formative assessment has replaced single final evaluation and become the mainstream evaluation method for domestic digital art majors [5].

5.3 Digital Ethical Governance and Continuous Curriculum Iteration

Campus AI usage rules require students to fully disclose AI auxiliary links, obtain legal material authorization, reject false visual content and protect portrait privacy, with ethical compliance counted as core assessment indicators. Curriculum improvement follows a closed cycle: Competency Analysis —► Implementation —► Evidence Collection —► Diagnosis —► Revision, adjusted by long-term vocational competency changes instead of temporary software trends. UNESCO's generative AI education guidance also emphasizes that digital ethics must run through all teaching links [9].

6. Conclusion

Integrating AI into vocational photography education demands systematic reform of talent cultivation targets, course layout, practical tasks, evaluation systems and cluster operation mechanisms. As an interdisciplinary bridge across photography, design, media and e-commerce majors under the Double High-Level Plan, the four-stage teaching scheme guides students from basic visual cognition to industrial creative practice. For western vocational colleges, this framework maximizes limited teaching resources and enables students to create localized cultural, ecological and commercial visual products via AI photography. Vocational education should focus on irreplaceable human strengths: visual judgment, human-machine collaboration, customized workflow design, ethical accountability and lifelong learning capacity. Domestic vocational education scholars consistently advocate that AI teaching should take cultivating human core competitiveness as the fundamental goal rather than simply training tool operation.

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