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Constructing and Implementing a "Three-Tiered Progression" Practical Teaching Model for Animation-Related Majors: A Case Study of Shenzhen Polytechnic University

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Abstract: Amid the rapid expansion of the digital creative industry and continuous advances in technologies such as artificial intelligence, the animation sector increasingly requires practice-oriented, technology-integrated, and cross-disciplinary talent. However, higher vocational programs in animation still face persistent challenges. On the one hand, curricular frameworks are often "broad but shallow," weakening teachers' and students' capacity to translate knowledge into industry practice. On the other hand, traditional course content has been slow to incorporate emerging technologies such as AI-generated content (AIGC), limiting the production of high-level innovative outcomes. This paper analyzes these challenges in current animation education and proposes reform directions.

Keywords: Digital creative industry; Artificial intelligence; Animation major; Talent development; Higher vocational education; AI-generated content (AIGC)

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1. Introduction

With the growth of the digital creative economy and technologies such as artificial intelligence, there is a rising demand for practice-oriented, technology-integrated, and cross-disciplinary talent in animation-related majors. Yet talent cultivation in higher-vocational animation programs faces several obstacles. Many curricula are broad but shallow, which undermines instructors' and students' ability to transform knowledge into industry practice [1]. In addition, traditional courses lag behind the industry's rapid uptake of AIGC and related tools, constraining high-level outcomes.

Today, the industry expects professionals not only to master conventional production skills but also to demonstrate fluency with digital pipelines, cross-media creativity, and literacy in technology integration.

However, many training models in higher-vocational institutions trail behind industrial practice, particularly in curriculum design and in mechanisms that incorporate new technologies in a timely way [2].

2. Major issues in current talent cultivation for animation specialties

2.1. Broad-but-shallow curriculum structures and weak industry alignment

Many vocational animation programs privilege breadth over depth by offering numerous courses without sufficient cutting-edge content. This structure fragments knowledge and produces superficial skills, impeding the development of robust core competencies [3]. Moreover, instructors often lack current industry experience and exposure to new technologies, widening the gap between theory and practice and limiting students' adaptability and innovative capacity.

2.2. Traditional courses lag behind technological advancements

As AIGC, virtual production, and real-time rendering mature across the animation pipeline, advanced technical literacy has become essential. Yet many courses still emphasize hand-drawn techniques or basic 3D workflows while neglecting AIGC applications, data-driven creation, and cross-media storytelling. Consequently, graduates struggle to meet expectations for emerging-technology skills, reducing both the quality and volume of innovative outcomes [4].

3. Theoretical connotation of the "Three-Tiered Progression" practical teaching model

Constructing a Three-Tiered Progression model requires clarifying its core concepts and operational mechanisms [5].

3.1. Exercise: Unitized tasks for foundational skill acquisition and verification

Within this model, an Exercise is a unit-level practical task designed to rehearse and verify a discrete knowledge element or skill. These tasks are typically context-bound and imitative; they emphasize procedural standardization and operational accuracy at the initial stage of knowledge internalization [6]. In a 3D animation sequence, for instance, controller binding or a foundational walk cycle constitutes a typical Exercise. The aim is to consolidate tool fluency and pipeline awareness, cultivating muscle memory and early problem-solving capacity through deliberate, spaced repetition. Accordingly, Exercises should be designed as a scaffolded, progressively complex sequence that underpins competency formation [7].

3.2. Work: Integrated artistic expression demonstrating comprehensive abilities and innovation

A Work is an artistic creation that integrates knowledge and skills from multiple courses and incorporates personal aesthetics and creativity to achieve completeness and originality [8]. It marks the transition from mastery to application, combining technical proficiency with innovative thinking. Typical examples include a short character animation or a game-ready character model accompanied by a playable demo. Compared with Exercises, Works emphasize wholeness, artistic merit, and narrative quality. Evaluation, therefore, moves beyond technical correctness to a multidimensional assessment of creativity, aesthetics, and technical execution. This stage is critical in transforming students from learners to creators.

3.3. Product: Outcomes validated by the market with practical and commercial value

A Product is an outcome that not only achieves artistic completeness but is also validated by the market and aligned with industry standards, demonstrating practical applications, user value, or commercial potential. It represents the highest tier of the Three-Tiered Progression model and directly reflects deep industry–education integration [9]. To qualify as a Product, an outcome must address specific market needs, satisfy industry technical specifications (for example, playback formats, rendering fidelity, and delivery requirements), and target a defined audience or client. Examples include IP character designs adopted by enterprises, revenue-generating animated series released on streaming platforms, and commissioned commercial animation produced for clients. Part of the evaluation, therefore rests with enterprises and the market, consistent with the vocational-education mission of serving development and promoting employment.

3.4. Progression: Advancing value, building ability, and deepening industry–education integration

Progression is the model's core dynamic and unfolds along three dimensions:

(1) Value progression

Outcomes evolve from the use value of coursework to the artistic value of personal creativity and, ultimately, to commercial value aligned with market needs—gaining depth in meaning and breadth in impact along the way.

(2) Ability progression

Students move from single-skill operations to collaborative project work, and further to market engagement and product-oriented thinking, following a spiral trajectory that holistically strengthens professional and innovative capacities [10].

(3) Industry-education integration progression

The connection between teaching and industry practice advances from initial project introduction (simulation), to standard implementation (alignment), and finally to outcome transformation (integration). School–enterprise collaboration deepens over time and ultimately merges into a unified whole; later stages subsume and elevate earlier ones [11].

Any effective teaching model rests on a solid theoretical foundation. The Three-Tiered Progression model draws on three major theories:

(1) Constructivist learning theory: Constructivism holds that learners actively construct knowledge in authentic contexts through social interaction and purposeful use of resources. It provides the core pedagogical stance for this model: situated learning at the Work tier; collaborative inquiry in the transition from Work to Product; and active construction through completing Exercises, Works, and Products.

(2) Contextualization (Situated Learning): Instruction at the Work tier situates learning within authentic, complex industry projects, exposing students to real constraints and problems that drive motivation.

(3) Collaborative learning: Moving from Work to Product typically requires team-based production in which students pool expertise, negotiate meaning, and co-construct shared knowledge and workflows.

(4) Active construction: Students shift from passive reception to active exploration, troubleshooting, and practice by completing sequenced tasks (Exercise → Work → Product), thereby building their own knowledge, skills, and experience base.

(5) Outcome-Based Education (OBE): OBE holds that instructional design and delivery should be planned

from the outcomes students are expected to achieve. In this model, backward design begins by specifying the competency goals required at the Product tier (e.g., graduation requirements) and then derives the necessary Works and Exercises to support those goals, thereby restructuring the curriculum and its assessments accordingly [12]. All activities concentrate on moving students from Exercise to Product while ensuring that every learner has pathways to succeed.

(6) Clear focus: Teaching, learning tasks, and assessment are aligned to promote progression from Exercise → Work → Product; the evaluation system is built to evidence and facilitate that progression effectively.

(7) Expanded opportunities: OBE emphasizes the opportunity to succeed for all learners. The Three-Tiered Progression model respects individual differences, enabling students to ascend the capability ladder at their own pace and in their own way.

(8) Industry-education integration and collaborative innovation theory: Industry–education integration is fundamental to modern vocational education, and collaborative innovation emphasizes coordination among multiple parties in knowledge, resources, actions, and performance to achieve innovation goals. Taken together, these concepts define the model's mechanism: co-cultivation by schools and enterprises, resource synergy and sharing, and the creation of a micro innovation ecosystem that spans industry, education, research, and competition [13].

(9) Co-cultivation by multiple stakeholders: Enterprises participate across the entire talent development cycle by jointly defining standards, providing live projects, assigning mentors, and jointly evaluating and accepting outputs at the Product level, thereby establishing a dual-subject education framework led jointly by schools and enterprises.

(10) Resource synergy and sharing: Schools and enterprises co-invest in technology, projects, equipment, and faculty across the Three-Tiered Progression, building shared practice platforms that enable resource complementarity and optimal allocation.

(11) Innovation ecosystem building: By integrating industry, education, research, and competition, the model builds a micro innovation ecosystem where teachers, students, and enterprise engineers work together. It strengthens student innovation and speeds up both technology adoption and content innovation for the industry.

In summary, the Three-Tiered Progression model is grounded in constructivism for implementation, guided by OBE in design, and enabled by industry–education integration with collaborative innovation as its mechanism. Together, these frameworks underpin the model's rigor and continued improvement.

4. Achievements of the three-tiered progression practical teaching model

The animation program has reconstructed its curriculum, course content, and evaluation methods around job competencies and emerging technological workflows. Leveraging the Vocational Education Teaching Resource Library for Film and Television Animation and multiple reform projects, the Exercise → Work → Product pathway has taken shape [14].

Grounded in job requirements and industry trends, the school systematically restructured its professional curriculum. The core innovation is a project-centered teaching mechanism that overcomes the limits of traditional single-subject courses and enables cross-course integration of knowledge and skills.

Specifically, the school partnered with CCTV Animation Group to establish a Digital Animation Full-Process Production Training Platform, introducing authentic enterprise cases and production standards. The end-

to-end workflow, including preproduction planning, character design, modeling, rigging, and animation, shot compositing, postproduction effects, and final delivery, is embedded across relevant courses. In core offerings such as 3D Animation Production and Motion Graphics Design, students no longer perform fragmented drills; instead, they work in teams to deliver phased modules of real animation projects. Each academic year includes weeklong intensive practice blocks, during which students, co-mentored by instructors and industry experts, integrate earlier assignments into coherent, industry-standard animated works with complete narratives, effectively bridging knowledge acquisition and capability formation.

To enhance the precision of talent cultivation and provide multi-dimensional resources, the school has developed a tiered curriculum resource system centered on job competencies. Anchored in emerging roles and technological directions in the industry, the system comprises three tiers:

(1) Basic module: Foundational art skills, software tools, and design theory.

(2) Specialized module: Project-based course packages for specific roles such as modeler, animator, technical artist, and AIGC application developer.

(3) Comprehensive innovation module: Cross-disciplinary collaboration and hands-on engagement with commercial projects, delivered through digital workshops and industry studios.

Building on this foundation, the school established a four-in-one resource system integrating Theory-Training-Certification-Promotion:

(1) Theory: Project-based loose-leaf textbooks and online open courses.

(2) Training: Practical training based on real enterprise cases and a virtual workorder system to strengthen hands-on skills.

(3) Certification: Industry-recognized skill credentials.

(4) Promotion: Outstanding works, jointly evaluated by the school and enterprises, are showcased on platforms such as CCTV Animation for market exposure and incubation. Some student Works have won awards at domestic and international festivals and progressed to IP commercialization.

In animation and digital media, the institution actively pursues technological innovation and sector leadership, building a closed-loop educational mechanism linking "technological innovation → curriculum application → competition outcomes → outcome transformation." This loop drives continuous iteration and value lift, moving routine outputs towards industry-level excellence.

The school also maintains dynamic alignment between enterprise technology portfolios and curriculum content. In collaboration with leading companies such as Huawei, Fantawild, and Global Digital, the school co-founded the Digital Media Technology Collaborative Innovation Center to integrate cutting-edge tools and workflows, AIGC-assisted creation, real-time rendering, virtual production, high-precision motion capture, and 3D scanning, into teaching in a timely manner. Enterprise experts and faculty jointly form research and development (R&D) and teaching teams that both deliver industry projects and rapidly translate the latest R&D results into teaching projects and training modules, ensuring that course content keeps pace with technological advances [15].

To implement a model that advances R&D, teaching, competition, and transformation in parallel, the school has formed several high-level teaching and research teams in frontier domains—including the AIGC Art Creation Studio, Virtual Reality Workshop, and Digital Animation Technology Laboratory—under a project-based management approach. A dual-mentorship system, jointly staffed by the faculty and enterprise mentors, guides students to engage directly in technological R&D and creative practice. Faculty–student teams undertake enterprise-commissioned projects and actively compete in high-level contests (e.g., the China International

"Internet+" Innovation and Entrepreneurship Competition, the National Vocational College Skills Competition, and digital-creative industry contests). This competition-driven approach strengthens teaching, learning, and research, establishing a sustainable mechanism for continuously enhancing technological application and innovation capacity.

Through this process, the school has established a systematic closed loop: innovations are integrated into classrooms via project-based courses and modular training; faculty and students leverage these results in major competitions, earning frequent national and provincial awards and generating strong demonstration value; and outstanding outcomes are commercialized and promoted through enterprise platforms, forming an end-to-end chain from technological breakthroughs to curricular application and social benefits. In terms of technological innovation and sector leadership, this approach has enabled continuous iteration from works to market-ready products. The curriculum remains dynamically aligned with enterprise technology portfolios; joint school–enterprise R&D focuses on AIGC, motion capture, and virtual production; high-level teams lead participation in competitions related to emerging technologies; and the R&D–teaching–competition–transformation model ensures the timely integration of new technologies into classroom practice.

This model has yielded a series of high-quality outcomes with broad industry influence and social recognition. Faculty–student teams have produced derivative Works for the Boonie Bears film series; created the animated promotional video for the Shenzhen–Zhongshan Link, aired on CCTV; and delivered multiple urban cultural IP digitization projects, all recognized for technical proficiency and artistic expression. These achievements highlight the institution's strengths in cutting-edge technology application and cross-disciplinary innovation, while offering a reference-worthy "SPU solution" to persistent challenges such as the lag between teaching and technological development and the difficulty of translating innovative outcomes into practice.

Through sustained accumulation and practice, the animation program has achieved notable results in institutional development, social services, and international collaboration, forming a replicable and scalable model for vocational education.

Institutional development. The school has established four national-level elite courses, published two national "14th Five-Year Plan" vocational-education textbooks, and developed 12 university-level "golden courses," accompanied by more than ten new-format textbooks. It has also reconstructed a specialized curriculum integrating posts, courses, competitions, and certifications. Over the past three years, faculty–student teams have earned more than 40 awards in high-level domestic and international competitions, including first prize in the National College Students Advertising Art Competition and the Best Animation Award at the Golden Strait International Microfilm Festival. Graduate outcomes have improved significantly, with employment rates above 98% for consecutive years; more than one-third of graduates have joined leading digital-creative enterprises such as Tencent, NetEase, and Fantawild.

Social services and outreach. The nationally recognized professional teaching-resource bank led by the institution has attracted more than 190,000 registered users, covering over 200 vocational colleges and 40 industry enterprises nationwide, effectively supporting cross-regional and cross-institutional resource sharing. Through industry–academia–research platforms, faculty and students have undertaken commissioned technical-service projects with cumulative funding exceeding RMB 7 million. The original animated IP, Mao Dou and Coffee Bean, has garnered more than 350 million online views, and multiple Works have been broadcast on CCTV's General and Children's Channels. The school has also hosted five national key teacher-training programs, training more than 200 teachers from over 30 institutions. Teaching outcomes have been presented at major events such as the National Vocational Education Conference and featured in authoritative media,

including China Education Daily.

International impact and standards development. The school has led the formulation of national standards in animation production and received the China Standard Innovation Contribution Award, underscoring its leadership in professional standardization. As a key member of the Shenzhen Protocol International Vocational Education Alliance, it has promoted mutual recognition of international standards in animation and exported specialized curriculum standards and teaching resources to Belt and Road partner countries such as Pakistan. Related achievements have been recognized as UNESCO exemplary cases and shared with 230+ institutions across 150+ countries and regions, providing a meaningful model for China's vocational education on the global stage.

5. Conclusion

The Exercise → Work → Product Three-Tiered Progression practical teaching model provides an effective pathway for deepening industry–education integration and elevating talent cultivation in animation specialties. By reconstructing a project-based curriculum, introducing authentic enterprise standards and workflows, and establishing platforms for outcome transformation, the model systematically addresses core deficiencies in traditional instruction, namely the disconnection between theory and practice, subjective assessment, and limited market adaptability. It fosters an educational ecosystem that integrates teaching, production, and innovation.

Evidence from Shenzhen Polytechnic University indicates that the model enhances students' comprehensive professional competencies, innovative mindsets, and labor-market competitiveness, yielding high-quality outcomes with both artistic and commercial value and generating broad demonstration effects. Looking ahead, the model should continue to iterate in response to rapid technological change (e.g., AIGC), deepen the internationalization of standards, and institutionalize long-term feedback mechanisms, to contribute a more generalizable paradigm for the high-quality development of vocational education in China.

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