Teaching Reform Pathways for 3D Animation Creation Courses in Higher Education under Industry-Education Integration

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Abstract

Industry-education collaboration should be enhanced to train talent in the form of 3D animation creation courses. Three obstacles persist: course content lags behind industrial iteration, faculty competence misaligns with integration requirements, and school-enterprise cooperation remains institutionally suspended at the curricular level. According to the ideas of outcome-based education and situated learning theory, this paper presents a model for analysing institutions-curricula-competencies. According to the above literature and policy-research data, how does industry-education collaboration affect course quality? Therefore, although cooperation has strengthened, it has not significantly improved due to a change in teaching methods. The problem is that teachers are still in a position of technical demonstration and not design. The four links of the chain are: Goal Reconstruction, Project Transformation, Faculty Collaboration and Assessment Reform.

Keywords

Industry-education integration, 3D animation creation course, teaching reform, pedagogical transformation.

1. Introduction

Industry-education cooperation is now a national institutional form. In 2025, there will be new integration models for the second stage of the Double High-Level Plan and reforms to the core teaching content. Cooperative Talent Cultivation is still a "virtualised" operation. The 3D animation creation course epitomizes this contradiction. It combines vocational education with art creation, and its quality depends on how well the course content meets the demands of the industry. The real-time rendering pipeline of Unreal Engine has replaced the old offline mode, and the gap between classroom Maya offline rendering and actual enterprise production is only widening. Research has shown that there are problems in content disorder, old-fashioned teaching methods and a homogenous faculty structure without innovation [1]. Most studies have only found a "disconnection" and have not explained how it happens; through what channels is industry-education integration affecting course quality? Why are the reform results of institutions so different despite their cooperation?

This paper investigates how to improve the quality of 3D animation creation courses through the integration of industry and education, and by what means. The theory does not offer an answer to the question of "how to cooperate", but rather to the "change process", so through pedagogical reform, the explanation gap in school-enterprise cooperation and course effectiveness can be closed. Based on the above, we will conduct a comparison of relevant studies and policies.

2. Literature Review

Research on industry-education integration courses has two main directions. Technology empowerment is the line of change for course forms. Luo Jinqun proposed the "cognition-practice-creation" integrated virtual-reality model [2]. Dong Haibin has listed the three problems systematically: content disconnection, old methods and uniform teachers [1]. Liu Fangyuan and others used OBE to show that, by reversing engineering from the needs of enterprises, course teaching could be optimised [3]. Zhou Xiaoyu believes that although AIGC has changed the creative workflow, corresponding teaching methods have not been established [4]. Guo Ruixin found that AIGC-assisted teaching is effective and novel [5]. Wo Chenwen has studied the new applications of 3D animation technology in digital art design [6], and Wan Shu has researched the design of digital textbooks for 3D animation courses based on AIGC [7]. The cooperation-form line focuses on industrial colleges, micro-majors and dual-mentor systems, but is still at the level of agreement and does not pay much attention to curriculum reform.

Although there is rich research on "why reform" and "what to reform" to date, how to effectively implement these reforms has not been studied in detail. Single-case descriptions are the main method; cross-case comparisons are unavailable, and little research has been done on the process of pedagogical transformation after enterprise projects enter the classroom. The importance of faculty quality is mentioned but not elaborated upon.

3. Theoretical Framework

Institutionalised education-industry cooperation is a form of education-industry collaboration. At the level of curriculum implementation, there are actual enterprise projects in the course, industry technical standards are added to the content, enterprise mentors participate in teaching, and course assessments are based on industrial delivery standards. The general direction of pedagogical reform is to take enterprise projects or industrial technical demands as the foundation and turn them into learning tasks, project designs, assessment criteria, etc., that are suitable for classroom teaching. It changes from "whether there is cooperation" to "how the resources of cooperation are used for learning".

The Institution-Curriculum-Competency Model is presented here. The institutional factor refers to policies and arrangements in terms of the curriculum. Curriculum dimensions refer to aims, content, delivery and evaluation. The competence dimension is the teachers' change ability and the students' professional development. The main idea is that the effect of industry-education integration on improving course quality is not directly related to the extent of cooperation but is rather transmitted through the quality of pedagogical reform. The four links of the chain are goal reconstruction, project transformation, faculty collaboration and assessment reform, and at the core is project transformation.

OBE has a reverse-engineering logic to find the main competency indicators of a position and then identifies course deficiencies [3]. Situated learning theory provides support for teaching in practice, and the idea of legitimate peripheral participation is the ideal role students should assume when moving from observers to project participants [8].

4. Research Methods

The two are literature comparison and policy text analysis. The sources of the data are academic studies on industry-education integration and animation curriculum reform, the animation major survey from the Education Channel of China Internet Information Center and the MyCOS employment report, and teaching experiment data indexed in ScienceDirect and KCI. The theme of the literature data was pedagogical transformation, and it was coded. The

first is directly from the original study, and the second is cited. Many sources have also carried out cross-validation for this.

5. Evidence-Based Analysis

5.1. Current Diagnosis

There is a gap between the course content and industrial needs. More than 65% of the courses in animation programs are still traditional 2D animation and basic 3D software; real-time engines and virtual production have not been added yet. The first few large enterprises have begun employing live-rendering virtual production and are now several years ahead in technology. Most institutions revise the main course content every 3-5 years, and the 3D animation toolchain is updated more frequently, roughly every 12-18 months [1].

Faculty Competence Constraints are more basic. According to a survey, 78% of animation teachers have never worked on commercial animation or game projects and are therefore unfamiliar with the industry's workflow, technical standards and project management. Most of the current "enterprise mentor in the classroom" models are lectures or short-term workshops and do not systematically promote talent development [1][3]. It will be difficult for teachers to judge the quality of the project and determine whether or how to modify it.

Institutional suspension of school-enterprise cooperation can be indicated by the lack of agreement clauses in the curriculum. Students lack motivation, there are conflicts with other classes, and the quality of tasks is low. The signed cooperation agreement will not change in practice.

5.2. Design of Path and Effect Reference

A Four-Element Synergistic Path with Project Transformation as its Core is Proposed. Goal reconstruction should add a "teachability screening" step to the OBE reverse design to determine which competencies are suitable for the course time, which have prerequisites, and which can be better achieved through enterprise internships [2]. The three stages of project transformation are difficulty adjustment, decomposition of enterprise-level projects into teachable subtask sequences, knowledge explicitation, conversion of mentors' tacit experience into teachable knowledge nodes, and reconstruction of assessment standards, and the creative process should be taken into account [2]. Faculty cooperation should build a knowledge-sharing system and establish a joint school-enterprise teaching and research group. The reform of assessment is changing from "work assessment" to a three-dimensional evaluation of process, work and reflection.

In terms of the effect group, 80 students (40 in the experimental group and 40 in the control group) were selected. VR devices and online platforms were used by the experimental group to obtain instant feedback and digital painting tools; the control group was taught via traditional lectures and computer lab exercises. The mean scores of the two groups were 87 and 81, respectively, and they were statistically different. Another comparison of generative AI and traditional 3D animation teaching (n=138) showed that AI teaching achieved a score of 4.72 out of 5 for "production speed and efficiency" and 4.65 for "classroom interest and immersion", but only 2.28 for "character appearance, performance and motion consistency" and 2.54 for "fine motion and performance control"; it was noted that the technical consistency was relatively weak.

According to the MyCOS report, the employment satisfaction of animation graduates in related areas was 79%, but the job-matching rates for the three animation-related majors were 66%, 64% and 69% respectively, all lower than the undergraduate average of 72%. The end result of curriculum reform is employment quality.

6. Conclusion and Recommendations

According to the institution-curriculum-competency framework and previous empirical studies, the following hypotheses are put forward in this paper. First, the improvement effect of industry-education integration on course quality may not be directly caused by the degree of cooperation but rather be mediated through pedagogical reform. Close cooperation does not guarantee better results; a company's project will only be beneficial if its purpose is effective learning and improvement. Secondly, the main content of transformation lies in the teachers' "capacity for change", and they should be able to grasp industrial technology and decision-making logic to design learning tasks that are appropriate for students' cognitive levels. Dong Haibin pointed out that a homogeneous faculty and weak innovation ability are serious problems, so we should focus on building transformation capacity. Thirdly, reform contradicts the ideas of authenticity and teachability. Enterprise projects have educational value because they are real-world problems, but they are often too time-consuming, complicated and difficult to spread the learning content evenly among students.

Recommendation: Establish an institutionalised pedagogical reform process to determine the value of project teaching, set grade-level difficulty and task decomposition, extract key knowledge points, jointly develop learning tasks and assessment standards with the school and the enterprise, and consider working hours. Increase the transformation capacity of the teaching staff: have some teachers participate in enterprise training for at least six months to learn about the company's work process and decision-making; establish regular joint lesson planning. Design a "flexible project" structure: A dual-layer structure of "core pedagogical modules + real-project extension modules" is used to balance organised learning and the difficulty of real-projects.

Limitations: This paper does not offer new empirical evidence and the results have not been verified. In the future, many more cases will be collected to observe the long-term employment effects and changes in teaching and learning caused by AIGC tools.

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