Four-Stage Task-Driven Teaching Reform for Applied Undergraduate Software Design Courses: A Case Study of Illustrator Commercial Design Instruction from the Industry-Education Integration Perspective

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Abstract

For software courses in the visual communication design major of applied undergraduate programs, three long-standing challenges have restricted teaching effectiveness: students find it hard to break away from long-established bitmap-based design habits, creative expression often fails to align with industry standard specifications, and teaching content arranged by software menus is disconnected from real workplace workflows. Taking the "Icon Design and Commercial Logo Implementation" module of the Illustrator Software for Commercial Design Applications course as a research sample, this paper follows the concepts of industry-education integration and the "job-curriculum-competition-certification" comprehensive education philosophy, and constructs a four-stage progressive task-driven teaching system. The system covers standardized systematic icon design, creative web icon development, data visualization icon creation, and vector-based commercial logo delivery. This paper summarizes the core characteristics of the teaching system and puts forward optimization directions including deepening industry-education integration and building a school-enterprise dual-mentor system.

Keywords

Applied undergraduate education, industry-education integration, four-stage task-driven progression, visual communication design, Adobe Illustrator.

1. Introduction

Applied undergraduate colleges take the cultivation of high-quality application-oriented talents for frontline positions in production, construction, management and service as their core mission. For curriculum design in such institutions, a fundamental question must be properly addressed: how to transform book knowledge into job-specific practical abilities [1].

As one of the most practice-oriented and interdisciplinary majors in the field of art, visual communication design relies heavily on software courses to build students' professional capabilities. Vector design courses represented by Illustrator are more than just tool training courses connecting basic design knowledge with commercial projects. They also play a key role in shaping students' professional ethics, aesthetic judgment and project delivery ability. However, according to the teaching practice of the author's team and investigations among peer colleges, such courses have been facing three prominent contradictions for a long time.

Most students have formed fixed bitmap thinking and layer-based workflow after learning Photoshop and InDesign in previous courses. It is usually difficult for them to transfer this thinking to the vector path and anchor point system. At the initial stage of learning Illustrator, it is very common that students can operate to make graphics but do not really understand the core logic of vector graphics.

There is also an imbalance between creative expression and the implementation of industry norms. Students often show great enthusiasm for visual exploration and experimentation, but easily ignore critical commercial delivery requirements, such as anchor point optimization, raster alignment, multi-color mode adaptation and standardization of source file delivery.

To solve the above contradictions, it is necessary to reshape the course orientation from "software function explanation" to "project-based ability training". Existing studies have made useful explorations from the perspectives of "job-curriculum-competition-certification" integration, project-based teaching and competition-driven learning [2], but there is still a lack of progressive schemes that cover the whole chain from entry-level icons to commercial logos for software design courses in applied undergraduate programs. Based on the construction of provincial first-class undergraduate courses and school-enterprise cooperation projects, this research takes the 16-hour "Icon Design and Commercial Logo Implementation" module as a sample, constructs a "four-stage task-driven progression" teaching system, and carries out a complete round of teaching practice in the target class, so as to provide replicable and transferable experience for software course reform in similar colleges.

2. Construction of the "Four-Stage Task-Driven Progression" Teaching System

2.1. Design Logic: "Two Transformations and Two Alignments" under Industry-Education Integration

The core of applied undergraduate curriculum reform lies in transforming the real production logic of enterprises into teachable pedagogical logic [3]. The teaching team established the overall design framework of "two transformations and two alignments" based on actual job demands.In terms of teaching design, typical commercial icon design projects in the industry are transformed into structured teaching projects, and the whole workflow of icon design is matched with the teaching process step by step. In terms of learning design, real enterprise icon design tasks are converted into progressive learning tasks for students, and the icon design standards and specifications widely used in the Internet industry are integrated into the core content of the course.

Under this framework, the course is no longer organized around the traditional software menu structure. Instead, it aligns with the National Standard for Teaching Quality of Undergraduate Majors in Ordinary Colleges and Universities and the talent training plan for design disciplines, and matches the job competency standards of three positions in Liaoning: local commercial graphic design, data visualization design and brand visual design. This design forms an integrated scheme of "core objectives – full-process implementation – resource support", ensuring that the ability training path is highly consistent with the actual job workflow.

2.2. Content Restructuring: A Progressive Task Chain with Four Stages

Following the law of progressive learning - from simplicity to complexity, from standardization to creativity, and from individual modules to integrated systems - the 16-hour module is split into four 4-hour units, which form a closely connected task chain with gradually increasing difficulty.

The first stage focuses on systematic standardized icon drawing, corresponding to the icon system construction tasks in the workplace. The core goal of this stage is to help students establish vector design thinking and set up clear delivery specifications for subsequent learning.

The second stage turns to creative web icon design, matching the icon design tasks for online scenarios. Teaching at this stage focuses on balancing the interest of online icons with professional standardization, and integrates positive online cultural values into the design process.

The third stage is about chart and infographic icon drawing, corresponding to data visualization tasks in actual work. A key professional principle emphasized at this stage is "data accuracy first", guiding students to avoid the wrong tendency of modifying real data for aesthetic effect.

The fourth stage centers on commercial logo vector graphic design, which connects with the core tasks of brand visual design. Students need to comprehensively apply the skills learned in the previous three stages, such as bitmap tracing optimization and text path conversion to avoid copyright risks, so as to complete the whole process of logo design and delivery.

2.3. Objective System: Three-Dimensional Integration of Knowledge, Competency and Quality

In line with the OBE (Outcome-Based Education) philosophy, the course sets measurable and achievable learning objectives from three interrelated dimensions.Knowledge objectives focus on the core logic of vector graphics software, the design principles of creative web icons, the usage of chart toolkits, as well as bitmap tracing and text-to-graphic conversion techniques. By the end of the module, students are required to fully master anchor point optimization, raster alignment, multi-color mode adaptation rules and commercial delivery standards, and get through the skill chain of "bitmap processing – layout typesetting – visual design".

For competency objectives, students are expected to independently complete four types of commercial-grade vector works, quickly diagnose and troubleshoot non-standard problems, and output multiple versions of deliverable files for scenarios such as online communication and print promotion. As a comprehensive task, students work in teams to deliver a complete project solution including "design brief + specification manual + source file package" with InDesign.

Quality objectives emphasize the sense of professional responsibility featured by "qualified delivery documents, zero-error source files and zero copyright risk", as well as the craftsman spirit of striving for excellence. The course also guides students to explore the modern transformation value of excellent traditional graphic symbols, such as cultural and creative products of the Palace Museum, Liaoning rural revitalization brands and local intangible cultural heritage. Students are encouraged to create original works that conform to positive commercial orientation and have regional cultural characteristics, so as to realize the unity of value shaping and skill training [4].

3. Teaching Implementation Path

3.1. Design of Hierarchical and Progressive Teaching Methods

Aiming at the different key and difficult points of the four stages, the teaching team adopts adaptive teaching methods matching each learning phase.

For the first stage, the prior knowledge transfer method is applied. Starting from the bitmap principles of Photoshop that students are already familiar with, instructors explain the lossless scaling feature of vector graphics by analogy, so as to reduce students' strangeness and learning anxiety. Then case analysis and step-by-step demonstration are used to help students break away from the fixed thinking formed by bitmap operation.For the second stage, intuitive demonstration and case appreciation analysis are adopted. The teaching team deconstructs real projects of positive energy warning icons on mainstream domestic social platforms, and integrates the guidance of online civilization values into technical teaching simultaneously.For the third stage, a combination of instruction and practice with a project-task-driven approach is adopted. Taking the "Provincial Industrial Development Annual Report" as the practical context, the course firmly prevents students from falling into the professional misunderstanding of tampering with real data for aesthetic purposes. For the fourth stage, the school-enterprise dual collaborative research method is introduced. Real projects from local

brand design companies in Liaoning are brought into the classroom, and teaching is organized in strict accordance with the actual industry workflow.

Throughout the course, a differentiated teaching strategy of "analogical inquiry, step-by-step practice, group collaboration and post-practice reflection and summary" is implemented to guide students to move from imitative operation to independent creative design [5].

3.2. Closed-Loop Teaching Process: "Understand – Explore – Investigate – Apply – Expand"

Each teaching unit strictly follows a standardized closed-loop process of "pre-class task preparation – in-class principle exploration, method research and learning by doing – after-class skill expansion". The first stage is taken as an example to illustrate the specific operation of this process.

Before class, students watch micro-lectures such as "A Quick Guide to Icon Design" and conduct research on commonly used APP icons, sorting out excellent cases and negative cases to form a research report. According to the data of completion rate and wrong question distribution from the learning platform, teachers give voice comments on common problems and provide one-to-one guidance for individual problems, promoting the transformation from "experience-based teaching" to "data-driven teaching".

In class, the teaching is carried out in three interlinked links. In the "principle exploration" link, each group reports their research findings from three dimensions: style consistency, size standardization and visual recognition. Combined with the real case of the Palace Museum APP icon system, the instructor explains the practical risks of non-standard vector files in printing and typesetting, and introduces the score deduction cases of previous competitions against the scoring criteria, so as to help students break through the difficulty of "establishing vector thinking".

In the "method research" link, students complete tasks including canvas setting, three-layer icon structure drawing and symbolic icon library construction according to the "Commercial Icon Design Specification Checklist". The instructor patrols for guidance and solves common problems such as "forgetting to copy before rotating" collectively, then releases the advanced task of "designing 12 functional icons for a smart campus APP".

In the "learning by doing" link, each group completes a standardized diagnostic report for an APP icon system and exports an application demonstration manual with InDesign. The instructor gives inspiration from three dimensions: standard compliance, style consistency and creative expression, so as to avoid the problem of "compliance for compliance’s sake".

After class, students conduct a multi-dimensional comparison among their own works, previous award-winning works and outstanding works from local enterprises. They sort out the differences in terms of anchor point quantity, alignment accuracy and output specifications, then iteratively optimize their schemes, and finally complete 12 sets of visual icons with cultural and creative themes as candidates for the competition.

The same closed-loop process is applied to the second to fourth stages, which are respectively carried out with three specific project carriers: "Social Platform 'Clear and Bright Initiative' Warning Icons", "Automotive Parameter Column Chart" and "Logo Upgrade of Liaoning Local Design Studio". After-class expansion further extends to local cultural tourism promotion icons, county-level economic visualization charts and vector logo systems for creative brands themed on Liaoning intangible cultural heritage.

3.3. Three-Dimensional Resources and Diversified Evaluation Support

The teaching implementation is supported by a three-dimensional resource system, including a vector design simulation training system, a commercial icon case resource library, and on-campus and off-campus practical training bases. It is also supplemented by Chaoxing Learning

Pass online courses, WeChat course groups and school-enterprise cooperative textbooks, covering all links before, during and after class.

In terms of assessment, the proportion of formative assessment is increased to 70%. Quantitative indicators such as anchor point redundancy rate, data error rate, copyright risk detection rate, standard compliance and process performance are all included in the evaluation framework, and enterprise mentor evaluation is also introduced. The key assessment criteria of competition works and certificate examinations are fed back to the classroom grading standards, forming a virtuous closed-loop system of "teaching implementation – data evaluation – scheme iteration".

4. Conclusion

To reshape software design courses with the "four-stage task-driven progression" approach is essentially to systematically translate enterprise workflows, industry norms and value standards into the learning progression of undergraduate classrooms. Teaching practice confirms that only when courses are built on real projects, based on detailed specifications, and promoted through data-driven instruction, can applied undergraduate software courses truly achieve the qualitative transformation from "teaching software operation" to "teaching project delivery", laying a solid foundation for students' job competence and sustainable innovation ability.

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