On CDIO Engineering Education Mode to Promote Project Integration
Teaching Reform in Higher Vocational Colleges

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Abstract. Teaching reform based on CDIO mode, is the key to break the discipline knowledge structure of inner logic and integrity, refactoring a project as the main line of teaching system, through the adjustment of related courses in higher vocational colleges, optimizing and restructuring, to achieve the knowledge, ability and quality of training objectives into project carrier, departing on ease of use.

1. Introduction

CDIO engineering education model is the latest achievement of education reform in international engineering in recent years. Since 2000, four universities, including the Massachusetts institute of technology and the royal Swedish institute of technology, have established the education concept of CDIO engineering and established the international cooperation organization named after CDIO after four years of exploration and research, with a huge funding of nearly 20 million us dollars. CDIO includes three core documents: 1 vision, 1 outline and 12 standards. Its vision provides students with an engineering education based on the background environment of the concept-design-implementation-run (CDIO) process with an emphasis on engineering basics, based on real-world products and systems. For the first time, its outline expresses the basic engineering knowledge, personal ability, interpersonal team ability and the whole CDIO whole-process ability of engineers in a step-by-step manner (level 3, more than 70, more than 400 types), making the reform of engineering education more clear and systematic. Its 12 standards provide systematic and comprehensive guidance for the implementation and inspection of the whole model, making the reform of engineering education specific, operational and measurable, and having important guiding significance for both students and teachers. CDIO embodies the unification of systematicness, scientificity and advancement, and represents the development trend of contemporary engineering education.

CDIO stands for Conceive, Design, Implement and operate-the whole life cycle of the teaching process as the conception, Design, implementation and operation of a modern Design product. It emphasizes the design project as the carrier, and guides the students to take the initiative, practice and the correlation between the course to discuss the problem solution way to realize the coordinated development of their own knowledge, ability and quality. Project scheme teaching embodies the CDIO "based on project teaching and learning" and "do school" teaching idea, is the teachers and students together around the project implementation and to carry out teaching activities, to complete work tasks in the process of implement the construction of knowledge, ability and quality cultivation, belongs to a kind of "behavior orientation" teaching method. By using the concept of CDIO education to conduct the project-based teaching of advertising design and production, we not only solved the coverage of the knowledge and ability of the project design, but also helped to cultivate students' engineering awareness, engineering quality and engineering practice ability. To achieve the expected teaching effect, the key lies in implementing the reform and construction of the teaching system in accordance with the integration concept. Among them, curriculum construction is the fundamental, teacher quality is the key, situational creation is the prerequisite, and innovation evaluation is the guarantee.
2. Study on CDIO Mode Combination of Advertising Design and Production Professional Course System and Project Integration

Teaching reform based on CDIO mode, is the key to break the discipline knowledge structure of inner logic and integrity, refactoring a project scheme integration as the main line of teaching system's overall framework, through the adjustment of related courses, optimizing and restructuring, to achieve the knowledge, ability and quality of training objectives into project carrier, departing on ease of use.

I) Build a new type of curriculum with links between courses. According to the characteristics of the organic connection between CDIO course, advertising and exhibition design professional basic knowledge, professional skills and comprehensive design of a three-stage course system to integrate, breaking the logical order of basic knowledge and professional skills, and combination relations, combined with the industry background and market demand, to build with project as the carrier of new courses and teaching materials. For example, three-dimensional composition and packaging design are integrated into a course design, plane composition and computer-aided design are integrated into a course. In the teaching process, the integrated thought of CDIO concept is used for reference, and the boundary between theory and practice teaching is abolished, which is divided into four stages: conception, design, implementation and operation.

2) Project units scientifically and reasonably. Learning is a progressive process. The advanced training of the project should conform to the cognitive law of students and follow the order of "introduction—expansion—integration", so that students can "learn well and do well". At the same time, on the basis of ensuring the typicality and integrity of the project, it is necessary to maintain the progressive level and consistency of the project, so that students can harvest the success joy of "building up a tower with accumulation" in the progressive development of the project design. Finally, CDIO mode emphasizes system thinking. The project-based teaching should start from the simulation of enterprise work process with series of simulation projects, and gradually transition to industrial competition projects and enterprise solicitation projects, so as to promote the interaction and transformation between part and the whole and realize the spiraling rise of knowledge system.

I) Enterprise cooperation to build a double-qualified team. School-enterprise cooperation can realize "zero distance" connection between school and enterprise, major and profession, theory and practice. Send teachers to investigate the front-line enterprises, understand the social needs, market dynamics, industry standards and technical specifications, and prepare plans for adjusting personnel training programs; At the same time, participating in enterprise projects, improving practical operation ability and professional technical quality, mastering enterprise advanced technology and management experience in practice, and growing into a technical leader or industrial engineer; Finally, the designer is employed as a part-time teacher from the enterprise, and the teaching ability is cultivated to improve the education teaching theory level and to teach the latest design concept to the students.

2) In the way of integration of science and education. The integration of science and education emphasizes on stimulating scientific research through teaching and research, guiding it through scientific research, providing experience support for academic teaching and improving teachers' ability to develop new curriculum resources. At the same time, the scientific research results will be converted into course content, teaching plan or handout, providing students with frontier knowledge of the subject, with emphasis on cultivating their engineering innovative thinking and scientific research questioning spirit.

3) Build an integrated test facility for production, education and research. According to the actual needs of the project, the "full simulation" design room, operation room and product library should be established, and the picture of equipment, information chart, construction background and other situational pictures should be posted to stimulate students' emotional experience. In terms of functional layout, there should be not only experimental areas, but also teaching areas and discussion areas to integrate training, skill identification and project development.

4) The workplace training function of the entrepreneurship center. The entrepreneurship center creates a real environment for students to train their skills and practice their entrepreneurship,
while setting up virtual companies in accordance with their professional direction. According to the market operation mechanism, the virtual company is managed and conducted by students independently. On the one hand, it enriches professional knowledge and engineering thinking method through project development. On the other hand, through company operation and management, students' engineering practice ability, such as communication, expression and team cooperation ability, as well as sense of responsibility, values and career attitude, is shaped.

3) Workshops of special ability. The workshop is the platform and link to enterprise projects. Through the platform, the projects and human resources of typical factories, design companies, scientific research institutions can be introduced, so that students can understand the design trend, market demand, production process and other information without leaving their homes. The platform implements the mentor responsibility system, is responsible for scientific research projects or enterprise bidding, guides the students to jointly complete the project implementation, the students who enter the platform fully participate in it, independently acquires the knowledge construction and the ability enhancement.

4) Production process table of studio project:

3. Key and Difficult Points in the Integrated Teaching of Advertising Design and Production in Higher Vocational Colleges

Project curriculum setting is the foundation of talent training program, so the realization of talent training goal should be reflected in integrated course teaching, which is also the focus and difficulty of this subject. At present, the curriculum system construction of advertising design and production in most vocational colleges in China is still in the exploratory stage, and there are many problems. This phenomenon directly leads to students' unclear understanding of the basic courses and compulsory courses of the major, and even some basic courses, thus affecting the practice of professional design and the development of design projects. In view of this phenomenon, this paper proposes the construction of the curriculum system of "curricular teaching + project teaching" based on the principles of "consistency", "diversity" and "sociality". The guiding idea of this curriculum system is: the same design subject runs through the course teaching and project teaching, and remains consistent. The design practice achievements are displayed on a diversified platform, and they are transformed into social productive forces through graduation design, giving play to their social functions (see figure 1).
4. The Reform of the Integrated Teaching of Advertising Design and Production in Higher Vocational Colleges

CDIO mode of teaching reform is the key to break the discipline knowledge structure of inner logic and integrity, refactoring a project as the main line of teaching system, through the adjustment of related courses, optimizing and restructuring, to incorporate the knowledge, ability and quality training target in project carrier, departing on ease of use. To achieve the expected teaching effect, the key lies in implementing the reform and construction of the teaching system in accordance with the integration concept. Among them, curriculum construction is the fundamental, teacher quality is the key, situational creation is the prerequisite, and innovation evaluation is the guarantee.

Blindly adopting social cross-sectional subjects. At present, many higher vocational colleges usually emphasize the practicality and authenticity of design projects when conducting project teaching, thus ignoring the matching and periodicity of projects and teaching. It is not only effective to solve the above problems, but also to eliminate the students’ dilemma about the project and carry out practical teaching from the simple to the profound.

Simple repetition and mechanical integration of the project. Because the design subject of students is determined from the first grade, each design link is decomposed into different courses for special training is easy to fall into the mistake of integrating design from the perspectives of program chemistry evaluation, creative evaluation and ergonomics. From the design subject to the project practice, it is necessary to constantly improve the design from the technical evaluation, functional evaluation, economic evaluation, safety evaluation, aesthetic evaluation, creative evaluation, ergonomic evaluation and other aspects of design criticism. In the stage of project teaching, it is necessary to break the thinking pattern of students, break the constraints of each training link in the course learning stage, stimulate students’ creative thinking, constantly improve each design link, achieve mutual penetration and organic integration, and finally form a mature design project.

Out diversified practice of project results. At present, it has become the direction of reform and development for many schools to build an integrated teaching model of production, study and research. This development concept is scientific, but it is very difficult to carry out. Many schools only stay at the form level of signing the joint construction base, internship base and alliance intention with relevant enterprises, and it is difficult to go deep into the enterprise to develop valuable project results. To solve this problem, it is necessary to grasp the basic work of "teaching" and "learning", constantly improve students' own projects, carry out diversified practices, gradually accumulate the conditions for mature projects, and finally attract the attention of enterprises and society, and finally realize the transformation of high added value. Students enter the third-level
project-driven learning stage, which is the golden period of three years of learning. Teachers should guide students to participate in diversified practice activities selectively and perfect their own projects in different types and styles of practice.

5. Conclusions

To take the initiative to adapt to market demand for high-quality talents in the field of advertisement design, and constantly strengthen the consciousness of professional work, according to the requirements of professional post, the reconstruction of teaching objectives and content, development work combined with a project course in the learning process, to explore the law of the formation of professional ability, enhance the professional adaptability and transfer ability of students.

In the teaching process, the teaching practice and course content selection of advertising design and production are combined to achieve the goal of "teaching" and "learning". We tried to reform the course content. The specific course content takes the actual project as the carrier, through the project system integrated teaching mode, the project work process reconstruction, then according to the teaching rules cognitive reconstruction of several project tasks, according to the work process step by step organization teaching, the student completes the task through the project team to obtain the related knowledge and the skill work.

The integrated teaching construction of cdio-based advertising design and production professional course system and project system determines the teaching objectives and contents, and the scientific key objectives of the organization. Each studio must have one or more businesses to rely on. The project teaching task will be realized in real or simulated teaching environment.

The examination and evaluation of project teaching focuses on the combination of process and result. The social inspection standard of teaching ability evaluation, combined with schools and enterprises, combined with teaching practice and theoretical research, combined with various forms of quantitative and qualitative evaluation, mainly evaluated the learning process of students.

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