

# Experimental Teaching of Java Interface Design Framework based on Obe-Cdio Concept

Ming Lu, Ji Zhao

School of Computer science and Software Engineering, University of Science and Technology Liaoning, Anshan 114051, China.

## Abstract

In order to eliminate the criticism of the traditional experimental teaching system, combined with the course of java interface design framework, the experimental teaching system based on OBE-CDIO concept is constructed. The three links of "module design → comprehensive design → project design" are used to cultivate students' design ability, project ability and innovation ability. The experimental teaching system takes the cultivation goal of students' ability as the core, OBE as the guidance, CDIO project driven teaching as the main line, and the output of students' learning achievements as the evaluation benchmark, so as to effectively cultivate students' various abilities. The teaching practice of two semesters shows that the experimental teaching system improves students' autonomous learning ability and innovation ability, and achieves good teaching effect.

## Keywords

Experimental teaching, OBE-CDIO concept, teaching system.

## 1. Introduction

"Java interface design framework" is a highly practical course, including jQuery, Vue.js Through the teaching of java interface design framework, students can get the JavaScript programming and design patterns, the basic use of the front-end framework, the front-end code layering and loose coupling Combined with the knowledge, cultivate students' ability to design reasonable web interface layout in different scenarios, and reasonably use different front-end frameworks and development tools [1]. In general, this course is a professional course to cultivate students' Web front-end development ability. The students need to meet the needs of employers for web front-end development. As the web front-end development is in the peak period of development, the Internet companies have significantly improved the quality of front-end development talents. On the basis of mastering solid theoretical knowledge, they pay more attention to design ability, engineering ability and innovation ability. Experimental teaching plays an important role in cultivating the above three abilities, and is of great significance to the development of software engineering and personnel training.

## 2. Criticism of Traditional Experimental Teaching System

There are many problems in the traditional experimental teaching system, which affect the students' learning effect to a certain extent.

(1) The training goal is not clear. The traditional experimental teaching system does not have enough clear teaching objectives. There is no clear plan for students' practical ability goal, which leads to the phenomenon that theory teaching is more important than experimental teaching in talent training, which makes experimental teaching only become the subsidiary and supplement of theoretical teaching.

(2) The content of the experiment is single. The content of the experiment lacks the practice of solving practical problems, and the content and method of experiment are stereotyped and repeated, which makes every student do the same thing, which can not reflect the effect of students' learning and is not conducive to the improvement of teaching quality.

(3) The experimental teaching method is old and single. In the current experimental teaching system, the experimental teaching is "indoctrinated", and the experimental objectives, contents and steps are designated by the teacher. The content is limited to the textbook and does not pay attention to practicality. Students only operate passively. There is no certain thinking and research before the experiment, and no preparation is made. This can not stimulate students' interest in the experimental content and the enthusiasm and creativity of learning. It is difficult to improve students' ability to analyze and solve problems, which also limits the development of students' innovation ability.

(4) The experimental examination is not scientific enough. In the current experimental teaching, the experimental evaluation is mainly based on the students' attendance rate, experimental attitude and experimental report. It lacks the evaluation of learning process and the evaluation of students' ability, which can not reflect the guiding role of evaluation on teaching.

In order to eliminate the criticism of the current experimental teaching system, it is necessary to carry out experimental teaching reform for the course of java interface design framework. Its significance is to break through the traditional experimental teaching methods, reform the experimental content and methods, give full play to the subjective initiative of students, and use OBE-CDIO to eliminate the criticism of the existing experimental teaching system [2], transforms social needs into students' ability training objectives at different levels, so as to cultivate students' practical ability and cooperation ability.

### 3. Experimental Teaching Method of OBE-CDIO Concept

The experimental teaching method of obe-cdio concept makes full use of the OBE (Outcomes Based Education) engineering education concept [3] Based on the results, which is very consistent with the target demand of application-oriented talents training, and attaches importance to the output of learning outcomes, so as to make students have the knowledge, ability and quality required by enterprise level development. Adopting the concept design implementation operating (CDIO) "Concept [4], guide students to study in an active and practical way, closely combine the cultivation of knowledge, ability and quality, integrate theory, practice and innovation, and realize the integration of professional knowledge, practical skills and professional quality through "project driven" teaching, so as to effectively cultivate students' design ability, engineering ability and innovation ability in experimental teaching. The obe-cdio concept is applied to the experimental teaching of java interface design framework. Through the analysis of the talent demand of society, market and enterprise, we can improve the quality of ability training, clarify the teaching objectives of experiment course, and then design the teaching links of each experiment in the course, and use CDIO The project driven teaching method [5] reasonably designs the design ability training link, engineering ability training link and innovation ability training link in the course, forms the spiral rising experimental teaching mode, and gradually cultivates the students' practical ability. Finally, guided by the output of learning results, the evaluation methods are reformed, and a multi perspective and three-dimensional assessment system is established to promote the continuous improvement of the experimental teaching system, and to achieve the training objectives of software engineering talents' innovation ability and comprehensive professional quality. Training talents with innovative design ability and comprehensive quality is the core goal of software engineering specialty construction. Through the construction of experimental teaching system of java interface design framework course based on OBE-CDIO concept, the

training objectives of experimental course with different levels of students' ability training as the core are defined.

Through the investigation of well-known universities at home and abroad, it is found that the key point of experimental teaching reform is to give full play to students' creative potential, mobilize students' learning initiative, so as to improve students' ability to analyze and solve problems. In order to achieve the above experimental teaching objectives and eliminate the criticism of the current experimental curriculum system, it is necessary to construct a new experimental teaching system and construct the experimental teaching system of java interface design framework under the concept of OBE-CDIO. First of all, we should realize the transformation from curriculum education to target education, which should be based on social and market demand. We should not only consider the initial job requirements of graduates, but also pay attention to the ability requirements of students in the follow-up career development, so as to meet the sustainable development. OBE concept oriented by learning output and CDIO based on Project The concept is applied to guide the construction of experimental teaching system of java interface design framework course, emphasizing student-centered, so that students have certain practical experience in design and development and scientific research, have good team communication and writing skills, and can better complete the comprehensive quality of expression, elaboration and report writing.

#### **4. Experimental Teaching System of "Java Interface Design Framework" based on Obe-Cdio Concept**

(1) With the ability as the core and OBE concept as the guidance, the experimental teaching objectives are positioned.

OBE concept focuses on learning output, and ultimately emphasizes the application and practical ability of students through knowledge learning [6]. "Java interface design framework" course trains web front-end development talents with good design and development ability and comprehensive quality to meet the needs of social and market development. Therefore, the setting of experimental teaching objectives should clearly reflect the support for graduates' various abilities. Combined with the characteristics of java interface design framework course and social needs, the ability requirements of graduates can be divided into three levels, namely, the cultivation of basic practical ability, the cultivation of comprehensive design and development ability, and the cultivation of innovative design and development ability and comprehensive quality [7]. The experimental teaching objective of java interface design framework is clearly divided into the ability training objectives for different levels of students. It not only enables students to master basic practical ability, such as the use of development tools, but also cultivates students' comprehensive design and development ability and innovative design and development ability, so as to realize the construction of progressive experimental teaching system.

(2) Taking the project as the main line and students as the main body.

CDIO project-based teaching is the key link in the experimental teaching of java interface design framework. Under the guidance of CDIO concept, with the project as the main line and students as the main body, the original fragmented experimental contents are connected into lines and expanded into areas, so that the students' design ability, engineering ability and innovation ability are greatly improved in the experimental teaching.

(3) Reform the evaluation method and realize diversified assessment.

Experimental teaching is an important part of the whole undergraduate course teaching. Students' assessment can not only be evaluated by simple score, but also combined with students' experimental process, experimental report conclusion, team cooperation, professional quality and other aspects of comprehensive evaluation. According to the clear

training objectives and the output effect of OBE learning achievements, a diversified assessment system is established. The course performance is mainly composed of usual performance, module design score, comprehensive design score and project design score.

(4) Specific implementation plan.

In order to cultivate students of different ability levels, three different teaching links are carried out in the experimental teaching of the whole course. For the simple course unit content, the module design link is mainly adopted, and a variety of modern teaching methods are used to stimulate students' learning initiative and creativity, and to cultivate students' practical design ability; for comprehensive experimental content, comprehensive design link is adopted to cultivate students' practical design ability. Cultivate students to gradually master the standard design process, be able to comprehensively use various methods to solve practical problems and cultivate students' comprehensive design ability; for enterprise project experiment content, project design is adopted, mainly relying on Teachers' horizontal and vertical scientific research projects, college students' innovation and entrepreneurship training projects and various competition projects of college students [8], based on the integration of science and education, competition and education. In the whole process of module design, comprehensive design and project design, relevant drills of conception, design, implementation and operation have been carried out [9]. Make students experience the whole process of learning from module development to project application, from theory to practice. In the aspect of assessment, not only the superficial performance of students is assessed, but also the module design and development ability, comprehensive design and development ability and project design and development ability are reasonably evaluated, the achievement degree of students' learning achievement output and training objectives is analyzed, and the module design and development ability, comprehensive design development ability and project design and development ability of students are mainly evaluated. Cultivate students' autonomous learning.

## 5. Conclusion

At present, the experimental teaching method has been implemented in class 19-1,2,3,4 of software engineering major in our university. After successful implementation, the experimental reform scheme is ready to be extended to the whole class curriculum. Through two semesters of teaching exploration, a relatively perfect experimental teaching system of "java interface design framework" based on OBE-CDIO concept is constructed. A variety of teaching measures are taken to fully mobilize students' learning enthusiasm. Through the establishment of project driven CDIO teaching and OBE students' learning achievement oriented experimental evaluation mechanism, students actively participate in the production, learning and research, so that students can no longer do it. In order to improve the students' ability, they should join the project to lay a solid foundation for the employment of students. Aiming at the training objectives of applied undergraduate talents, this teaching method pays attention to the teaching requirements of practical ability training, breaks through the traditional experimental teaching method, eliminates the criticism of the current experimental teaching system, reforms the experimental content and method, and gives full play to the subjective initiative of students. The concept transforms social needs into different levels of students' ability training objectives, so as to cultivate students' practical ability and professional research cooperation ability.

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