

# Application of Project-Based Learning in Teaching of the Curriculum of Combining Study with Work of Higher Vocational Education

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**Abstract.** The curriculum of combining study with work is the curriculum reform result of higher vocational education in China, and it has been proven to meet the personnel training orientation of vocational education. However, for the teaching of the curriculum of combining study with work, systematic guidance theory has not been produced yet, and researching on its effective teaching mode has become the most urgent problem needed to be solved at present. Project-based learning is a new teaching mode and has aroused more concern in many of our higher vocational colleges in recent years. This paper designs the project-based learning method for study-work combinative courses of higher vocational education according to the characters of the curriculum of combining study with work. Practice results show that the project-based learning method in this paper is suitable for teaching of study-work combinative courses of higher vocational education, stimulates students' learning enthusiasm and improves their vocational skills and comprehensive abilities, but it requires higher energy and abilities of teachers comparing with traditional teaching methods.

## Introduction

With economic development, China's higher vocational education has obtained rapid development and becomes a new type of higher education. However, there are some problems that can not be ignored in the rapid development process of higher vocational education with the obvious expression of low-quality personnel training, which is unable to meet the needs of the community, therefore, the reform of higher vocational education is imperative [1] [2]. Curriculum reform is the core of higher vocational education reform, and our vocational education experts, on the basis of learning and using the curriculum reform and development experience of foreign vocational education for reference, proposed the development theory of the curriculum of combining study with work which has become the guiding ideology of the curriculum reform on our higher vocational education [3]. Recently, our higher vocational colleges have basically completed curriculum reform and established professional curriculum system of combining study with work. The curriculum of combining study with work is the curriculum based on work process, and the traditional discipline curriculum teaching mode based on teacher-centered instruction and knowledge-based transmission has been unable to satisfy the teaching of the curriculum of combining study with work [4]. For the teaching of the curriculum of combining study with work, systematic guidance theory has not been produced yet, and researching on its effective teaching mode has become the most urgent problem needed to be solved at present [5]. The main research content of the paper is to apply project-based learning into the teaching of higher vocational education and propose the design and implementation of project-based learning applied into the curriculum teaching of combining study with work.

## Design and Implementation of Project-Based Learning in the Curriculum of Combining Study with Work

The curriculum of combining study with work is action system curriculum, curriculum learning is completed through action, and students obtain vocational skills and comprehensive abilities in

action, which requires situation, achieved by a specific carrier, should be designed in curriculum teaching [6]. Project-based learning is based on project as a carrier and complete teaching process through project activities, and students acquire the corresponding vocational skills and comprehensive abilities through project activities, therefore, the mode of project-based learning can complete the teaching of the curriculum of combining study with work [7] [8]. Aiming at the characters of the curriculum of combining study with work, the process of design and implementation of project-based learning in the teaching of the curriculum of combining study with work should contain three basic components: project design, project implementation and project evaluation.

#### A. Project Design

Project design, the foundation of project-based learning and the organization of teachers on teaching contents, is divided into three steps-- project selection, project modification and project dissolution.

Project selection. The objective of project-based learning is to improve students' vocational skills and comprehensive abilities which are thought to be acquired in job post in traditional teaching. Projects should come from actual business projects of enterprises in order to make students experience real working tasks of job posts in the course study. Thus, teachers should go to survey enterprises and search projects in the posts corresponding to their majors.

Project modification. The projects from enterprise are always the large-scale comprehensive applied projects including multi-course knowledge, which are not suitable as the teaching project of a course, therefore, after adopting the project from an enterprise, the teacher must modify the project in accordance with course contents and teaching time, and makes it become the teaching project that contains the course content and can be completed in specified teaching time of the course.

Project dissolution. Teaching project associates with the core knowledge of curriculum, and its scale is still relatively large, while, the teaching time of curriculum is often scattered throughout the semester. In order to master teaching schedule and control teaching effectiveness, the teacher must decompose teaching project into subprojects based on working process, and each subproject should be a relative complete working process. Then, according to the knowledge associated with subprojects, the teacher reintegrates the theoretical knowledge of the curriculum and constitutes teaching units in one-to-one correspondence with subprojects.

#### B. Project Implementation

Project implementation is the main body of project-based learning and the process in which teachers and students carry out the activities of teaching and learning. Project implementation is divided into three steps which are project introduction, subproject implementation and subproject integration.

Project introduction. Project introduction is usually arranged in the first lesson to prepare for the implementation of project-based learning. First of all, teachers should demonstrate and explain the basic requirements of project to students and make students have an overall understanding of the project prior to project implementation and a basic understanding of curriculum requirements. Secondly, teachers should explain organization and arrangement of project activities to students, such as group and evaluation arrangements, etc. so that the project activities of students in the future are in the orderly and smooth way.

Subproject implementation. The main process of project-based learning is the process of each subproject implementation which should be ensured to be basically the same so that students gradually generate vocational skills and comprehensive abilities in the repeated action. Before subproject implementation, teachers should firstly demonstrate and explain the basic tasks of subproject to students, then, analyze and explain the associated knowledge according to tasks of subproject. When analyzing and explaining associated knowledge, teachers should prepare corresponding small cases and tasks which can lead knowledge so that students can understand the basic application of the knowledge while accepting, and the knowledge can be better applied to the project. After accepting associated knowledge, students begin to complete subject by groups. In the

process of students completing subject, teacher is the leader, and student is the main body. Teacher should observe and grasp the completion of various groups in time, participate in students' discussion, lead students to analyze, think, explore and solve the problems and develop students' vocational skills and comprehensive abilities consciously.

Subproject integration. After completing, each subproject should be integrated into a complete project. In this process, teacher only needs to explain the basic method and suggests students complete the specific integration process and make more use of extracurricular time to perfect the work. Teacher should give different guidance based on each group's completion performance of the subprojects, encourages the groups that well complete the subprojects to expand functions and stimulates their creativity; for the groups that don't well complete the subprojects, teacher should recommend them to improve their own subprojects based on the explanation and reports of subproject from other groups and practice the original tasks that is not familiar enough once again.

### C. Project Evaluation

Project evaluation is the supplement of project-based learning and the summary of students' learning processes and outcomes. Students can sum up experience and find inadequate by project evaluation. The implementation of each subproject is a complete working process, after a subproject completed, it should be evaluated. By doing it time and time again, students repeatedly summarize, continue to accumulate and thereby improve cognitive structure. Project evaluation includes two steps-- process assessment and summative assessment.

Process evaluation. Process evaluation is the evaluation on project implementation process. Each group member firstly conducts self evaluation based on the tasks that self completes and impersonative role in the subproject activities, and then the teacher evaluates the attitude and behavior of each student in the subproject activities and give a rating for each student with the combination of his self evaluation. In the process, students' self assessment is often exaggerated, however, teacher's evaluation should be specific, practical and realistic. Teacher is required to carefully observe students' project activities, understanding more, ask more and make the necessary records in time so as to make students convinced in evaluation.

Summative evaluation. Summative evaluation is the evaluation on project results. The headman of group firstly demonstrates his subproject results, introduces the techniques and methods of the subproject implementation and evaluates the advantages of the subproject results, and then the other group members ask questions and evaluate the disadvantages of the subproject results, finally, the teacher evaluates the subproject results and gives a rating for the subproject with the combination of the self evaluation and mutual evaluation of groups. In the process, the self evaluation and mutual evaluation of groups are often subjective, but the teacher's evaluation should be objective and fair and is required to be artistic. The teacher should praise the students that have obtained outstanding achievements and let them start the next subproject with successful joy, and point out the disadvantages of poor results and propose improving methods, meanwhile, it also needs to encourage that they have confidence to complete the next subproject.

## **Analysis of Applied Results on Project-Based Learning**

We selected two freshman class from software technology major in Taizhou Vocational and Technical College as experimental subjects, the number of students in two classes was 38, and the same specialized curriculum system of combining study with work was used. In the curriculum teaching of combining study with work, one class, adopting the project-based learning that the paper designed, was named experimental class, and the other class, adopting traditional teaching, was named contrast class. After students finished the study of higher vocational education stage, we conducted contrast analysis of four indexes-- the number of award-winning student in vocational skill competition, the number of excellent grade student in graduate design, the first employment rate and the employment rate consisting with professional, and the results are as shown in Figure 1. By analyzing Figure 1, the conclusions can be drawn that the project-based learning method in this paper can stimulate students' learning enthusiasm, improve their vocational skills and comprehensive abilities, and is suitable for the teaching of study-work combinative courses of

higher vocational education. In addition, the practice results also show that the project-based learning requires higher energy and abilities of teachers comparing with traditional teaching.

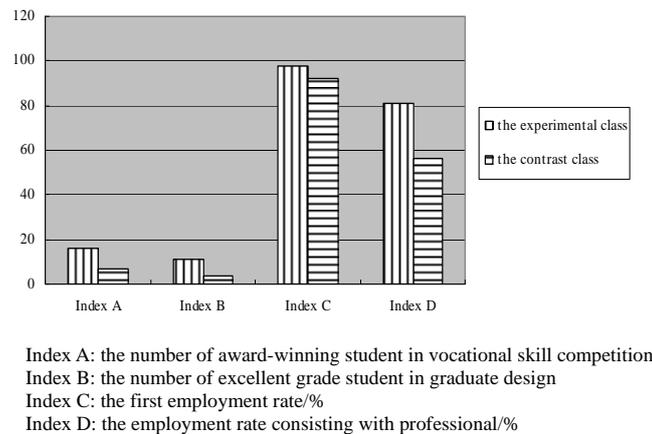


Fig. 1. The contrast of teaching results between project-based learning and traditional teaching

## Conclusion

Project-based learning has aroused the concern of an increasing number of higher vocational colleges and is still at the exploratory stage in the teaching of study-work combinative courses of higher vocational education [9]. Aiming at the characteristics of study-work combinative courses of higher vocational education, this paper designs the method of project-based learning, which provides a feasible solution for the teaching implementation of study-work combinative courses of higher vocational education. Project-based learning has a wide applied space in the teaching of higher vocational education and is worth further studying.

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