



# Research on the Application of "Problem + Task" Double-driven Teaching Mode

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**Abstract.** The achievement of teaching objectives and the exertion of teaching effect can not be separated from the effective teaching mode. According to the ability and quality objectives of curriculum training, the basic implementation ideas of "problem + task" dual-driven teaching mode are analyzed. The implementation method and process of "four stages, eight steps and three cycles" of the "problem + task" dual-driven teaching mode are defined. The follow-up problems of the implementation of the teaching mode are considered, which provides a new way of thinking for the reform and development of the teaching mode.

**Keywords:** "problem + task" dual drive; teaching mode; application method;

## 1 INTRODUCTION

The setting of curriculum teaching mode is based on certain educational concepts and objectives. It usually includes two aspects: career orientation and quality orientation. Career orientation is usually oriented to students'future career needs. Focus on improving students' knowledge and ability in a certain field through the optimization of curriculum teaching mode<sup>[1][3][4]</sup>.Quality orientation usually pays more attention to the cultivation of students'professional quality. It emphasizes that the quality of students in a certain professional direction can be improved through the optimization of curriculum teaching mode<sup>[2][5][6]</sup>.Problem-driven is a problem-oriented teaching method, which can cultivate students'autonomous learning ability and innovative ability. It is helpful for students to think deeply and understand the problems of professional quality. Task-driven mode is a teaching mode in constructivism theory, which emphasizes students as the main body. By completing relevant tasks to achieve the understanding and application of curriculum knowledge, we can focus on cultivating students'ability to understand and apply knowledge. It is conducive to the cultivation of students' knowledge and skills in their future career. Therefore, the "problem + task" dual-drive mode is a teaching mode that combines career orientation with quality orientation. Based on this mode, the implementation of curriculum teaching can better achieve the ability and quality objectives of curriculum training.

## 2 BASIC IDEAS FOR THE IMPLEMENTATION OF "PROBLEM + TASK" DUAL-DRIVE TEACHING MODE

The "problem + task" dual-driven teaching mode takes the main teaching objectives of the course as the traction, and refines the list of problems of the course according to the teaching content. The problems and teaching objectives are classified and mapped. Based on the list of questions, sort out the tasks that need to be completed in the teaching process and the ideological and political content of the course. Based on the problem list and task list, the curriculum assessment index system is constructed according to the hierarchical decomposition method. As shown in Figure 1.

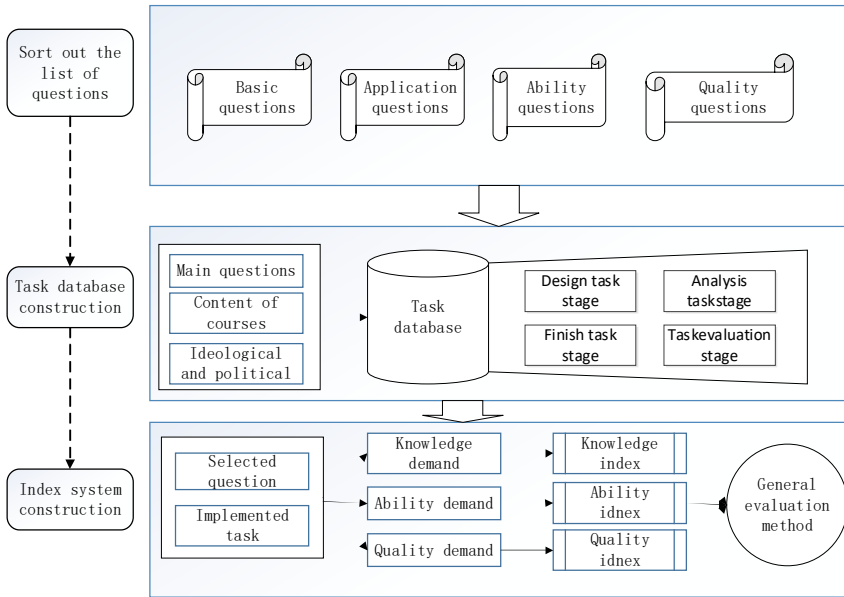


Fig. 1. Schematic diagram of implementation of "Problem + Task" Dual-Drive Teaching Mode

### (1) Detailed list of questions

According to the analysis of the learning situation of the previous course teaching, the teaching objectives of the course are analyzed. Make clear the main problems that need to be solved in the teaching process, and summarize the solutions. According to the principle of "knowing the principle, knowing the application and strengthening the quality", the main problems of the course are refined and the list of problems of the course is constructed. Define the questions related to basic knowledge in the list of questions so that they correspond to the knowledge objectives. Define the questions related to the use of knowledge in the list of questions, so that they correspond to the ability objectives. To sort out the questions related to professional accomplishment in the list of questions so as to make them correspond to the quality objectives.

### (2) Optimize the construction of task base

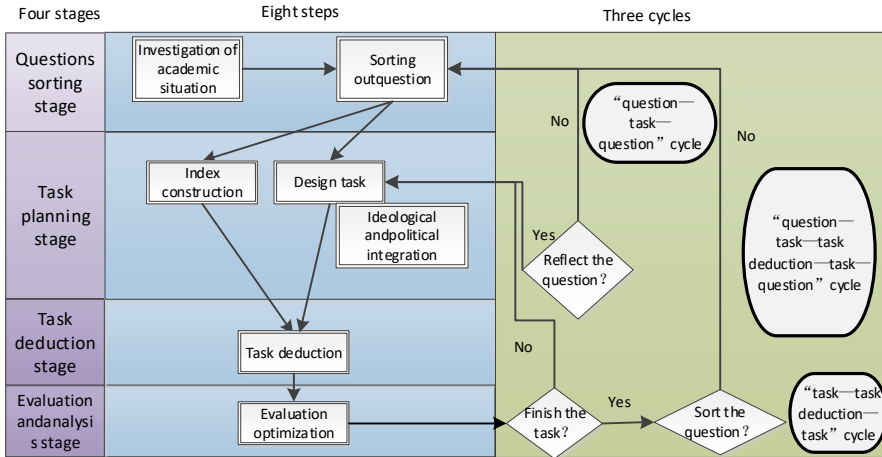
Situational cognition theory based on the organic integration of knowledge and skills, process and method, emotion, attitude and values. Combining with the current hot issues of professional direction, the ideological and political elements are refined from the aspects of professionalism, research spirit, love and dedication. Combining with the list of questions and teaching objectives, the main tasks of the course teaching are defined, and the main tasks are decomposed according to the stages. Determine the specific content of the corresponding knowledge, ability and quality in each task stage, the main problems that can be solved, and the ideological and political issues involved. Rong et al.

### (3) Stratified construction of evaluation index system

The index system is established from top to bottom according to the way of "problem/task-knowledge/ability/quality demand-assessment index". In general, a problem or task may consist of several subproblems or subtasks, sub-problems or sub-tasks can more clearly and specifically describe the required knowledge, ability or quality requirements. That is, sub-problems or sub-tasks can be mapped to knowledge/ability/quality requirements. To meet the needs of knowledge/ability/quality, specific indicators are needed to achieve it. In this way, the corresponding relationship between knowledge/ability/quality requirements and specific assessment indicators is established. After completing the hierarchical decomposition of all problems and tasks, the curriculum evaluation index system can be constructed. The weight of each index is determined according to the analytic hierarchy process and other methods, and the quantitative analysis of the index is carried out according to the analytical method. The comprehensive index aggregation is realized according to a certain index aggregation method, Finally, an evaluation index system with standards, scoring basis and quantifiable conclusions can be formed. The evaluation conclusion can comprehensively reflect the comprehensive learning effect of students.

Second, the implementation steps of "problem + task" dual-driven teaching mode

According to the implementation idea, the dual-driven teaching mode of "problem + task" is implemented on the basis of wargame deduction. It is mainly guided by the maritime direction to deal with new threats in the information field, and is implemented in accordance with the "four-stage, eight-step and three-cycle" approach. "Four stages" means that the whole teaching mode includes problem sorting stage, task planning stage, task deduction stage and evaluation and analysis stage. Section and other four main stages. "Eight steps" refers to the application of teaching mode, which mainly includes curriculum analysis, learning situation investigation, problem sorting, ideological and political integration, and tasks. Design, index construction, task simulation, evaluation and optimization. "Three cycles" means that the application of teaching mode needs to go through "problem-task-problem" and "task-simulation analysis-responsibility". There are two small cycle processes of "task" and one big cycle process of "problem-task-simulation analysis-task-problem". As shown in Figure 2.



**Fig. 2.** Schematic diagram of implementation steps of "Problem + Task" Dual-Drive Teaching Mode

(1) Problem sorting stage

This stage is the preparation process before the beginning of the course, which is led by the teachers of the course group. This stage mainly considers the needs of students with different majors, different experiences and different training levels for the elements of the course content and students. The source and professional characteristics are based on the theoretical knowledge and applied knowledge of the course. Properly supplement the new application level and quality level knowledge in the professional field. The curriculum content system with "theoretical knowledge + applied knowledge + new knowledge" as the main body has been formed. So as to achieve the unity of high-level, challenging and basic curriculum, and make the elements of curriculum content more universal. At the same time, according to the teaching needs of different training levels and different professional backgrounds, the content system can be adjusted flexibly in proportion. Make the teaching content match the teaching needs of the course. After clarifying the teaching content, the main problems are sorted out in the order of "knowing theory → knowing application → strengthening quality". The pull rod list forms a list of questions, and the list of questions corresponds to the teaching objectives and contents.

(2) Task planning stage

This stage is the process from the list of questions to the completion of the task simulation by the students after the start of the class, which is student-led and teacher-guided. At this stage, teachers need to guide students to understand and design the tasks involved in the questions according to the list of questions. The core part of task understanding is the decomposition and analysis of the task, that is, students need to know what the task corresponding to the problem is. What theoretical knowledge is needed to complete the task and the main knowledge content involved in the task. The main way for students to understand the task is to think about the task through various means and to understand the task through case analysis.

In the process of task design, students need to decompose the task and divide it into task stages. In this process, students first learn task-related knowledge through a variety of learning resources, and then divide the task into stages according to the actual situation. In this process, students intuitively feel the key and difficult problems in the task stage and the aspects that need to be focused on. Finally, the final task decomposition document is formed by constantly modifying and improving the task phase.

In the process of understanding and designing tasks, we also need to go through a small cycle of "problem-task-problem". That is to say, after students understand and design the task, they need to further understand the task. Analyze whether the designed task can correspond to the relevant problem and whether it can provide support for solving the problem. If the task does not correspond to the problem or does not provide support to solve the problem, the task or problem needs to be revised. Through the process of repetition, the problem is finally consistent with the task.

### (3) Task deduction stage

This stage is the process for students to complete task analysis and implement task deduction, which is student-led and teacher-assisted. This stage is a simulated presentation process of the whole course task. Students take the task decomposition file completed in the task planning stage as the input, and carry out the task deduction through role-playing and simulation. Through task deduction, on the one hand, we can further test and analyze the completion of the task. On the other hand, it can improve the ability of students to use theory to guide practice flexibly.

At this stage, teachers need to track and master the students' task deduction. Ensure that the questions raised by students are answered or solutions are provided in a timely manner. The deviation of students in the process of completing the task deduction should be corrected in time, and the unexpected situation can be adjusted in time. At the same time, teachers also need to collect data from students in the process of task deduction. In order to carry out comprehensive evaluation according to the index system.

### (IV) Evaluation and analysis stage

The evaluation and analysis stage refers to the process from the end of task deduction to the final evaluation of the course, which is completed by both students and teachers. This stage is mainly through the analysis of the whole task deduction process. It provides support for the summary, comment, exchange and discussion of the completion of the course tasks, and provides reference for the solution of the problems. At the same time, teachers can also collect data, combined with comprehensive evaluation methods to obtain students' assessment results.

This stage needs to complete the small cycle process of "task-simulation analysis-task" and "problem-task-simulation analysis-task-problem" big cycle. The small cycle process of "task-simulation analysis-task" is to analyze the target of the task after each task deduction is completed. Make clear whether the goal is achieved, if not, revise the task and deduce the analysis again. The big cycle process of "problem-task-simulation analysis-task-problem" is after the completion of the whole task. According to the specific situation of the task, it is clear whether it can provide reference for solving the problem. If not, revise the problem or task and enter the deduction analysis process again.

Third, further thinking on the application of "problem + task" dual-driven teaching mode

At present, the "problem + task" dual-driven teaching mode has been carried out in the actual teaching research and application, and achieved good results. In the process of research and practical application, it is found that in order to strengthen and highlight the application of the dual-driven teaching mode of "problem + task". It needs to be strengthened in the following aspects.

(1) The application of teaching mode needs to pay attention to differences

Some courses have a wide range of students. There are great differences in students' leading training experience, professional orientation, work experience and positions. The application of "problem + task" dual-driven teaching mode requires comprehensive consideration of students with different majors, different experiences and different training levels. The needs of the elements of the curriculum system, the design of problems and tasks need to take into account the source of students and professional characteristics. While emphasizing the new knowledge of professional direction, we also need to give due consideration to the basic knowledge of professional direction. To achieve the unity of high-level, challenging and basic courses, and to make the elements of the curriculum system more universal. Course teaching can adapt to the teaching needs of different training levels and different professional backgrounds. At the same time, according to the characteristics of students, we need to make full use of the results-oriented (OBE), modular curriculum (MC), differentiated teaching concepts and so on. Through the study of learning situation, the understanding ability of the teaching object to the course content is analyzed and studied. Quickly identify the actual needs of students of different majors and levels, and realize the precise docking of teaching mode and students' professional needs. Actively explore the "problem + task" dual-driven teaching mode as the basis, and establish the "students' professional needs" as the guidance. Based on the modular curriculum system, customized teaching is the implementation mode of the customized teaching program. The training scheme can be adjusted adaptively and dynamically according to the situation of the trainees. The training mode has changed from the traditional "unified serial chain learning" to "personalized parallel module learning". To meet the individual learning requirements of students with different majors, different foundations and different development needs.

(2) The application of teaching mode needs to play a guiding role.

Under the "problem + task" dual-driven teaching mode, students are no longer passive recipients of learning, but the main body and leading role of learning. Teachers are no longer simply "preaching, teaching and dispelling doubts", but designers of teaching conditions. He is also a student's learning inspector, supervisor and helper. The role change of teachers in the "problem + task" dual-driven teaching mode. Teachers are required to take into account the teaching content, students' majors, students' leading courses, students' experience and so on. Carefully design the whole teaching environment, and make full and meticulous choices and assumptions about the background, level and other aspects of teaching. The change of students' roles requires students to abandon the traditional indoctrination teaching ideas. We should abandon the habit of not thinking and learning actively, and integrate ourselves into the teaching back-

ground. In the task simulation, more self-management and self-monitoring are carried out to achieve the purpose of understanding knowledge and applying knowledge. "Problem + task" dual-driven teaching mode is to enable students to truly experience the application of knowledge in practice. They feel more deeply that the knowledge they have learned is available, so as to stimulate students' enthusiasm for learning. More emphasis is placed on students'ability to think and solve problems in practice. These have higher requirements for students'autonomous learning consciousness, only students really have a strong sense of autonomous learning. Only in this way can the students' learning initiative be fully mobilized and the students be truly integrated into the conditions. Only in this way can we truly reflect the effect of teaching.

In view of the difficulties that may be brought about by the change of students'roles, the improvement of their awareness of autonomous learning and the increase of the difficulty of self-study. Teachers need to actively guide, pay attention to the cultivation of students' awareness of autonomous learning, and strengthen the guidance of students' autonomous learning. Teachers also need to make more detailed choices of teaching content and more flexible settings of training methods. Through a variety of ways to stimulate students' learning initiative and enthusiasm, So as to guide students in the learning process spontaneously for their own weak links in self-learning, self-improvement.

(3) The application of teaching mode needs to accelerate the construction of teaching resources

When implementing the "problem + task" dual-driven teaching mode, students generally reflect that the course content is novel and targeted; The teaching methods are various and enlightening. However, in most cases, task analysis simulation mainly focuses on classroom teaching. After class, there is a lack of means and ways to further study, and a lot of information is difficult to obtain. The above problems reflect the contradiction between the application of "problem + task" dual-driven teaching mode and the supply and demand of teaching resources. Therefore, while highlighting the application of "problem + task" dual-driven teaching mode, we also need to pay attention to the construction of matching teaching resources. In particular, we should make full use of the network conditions and increase the construction of MOOC, online virtual courses, online simulation systems, and information service platforms. It enables students to use a variety of teaching resources to learn relevant knowledge at any time and anywhere besides classroom teaching. So as to better achieve the "problem + task" dual-driven teaching effect.

### **3 CONCLUDING REMARKS**

This paper discusses the basic ideas and implementation methods of the application of the "problem + task" dual-driven teaching mode. The basic implementation steps of "four stages, eight steps and three cycles" are defined. Combined with the main steps, the application process of the whole process from course analysis to course assessment is determined. The "problem + task" dual-driven teaching mode has clear ideas, clear

steps and strong operability. It can play an important role in course teaching, and also provide feasible ideas for the reform and optimization of teaching mode.

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