

# Promote the exploration and research of the collaborative education model of "production& competition&innovation and achievement"

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## Abstract

**This project relies on the Shipbuilding Association, according to the professional knowledge characteristics, hobbies and comprehensive quality development needs of the students majoring in ship engineering technology, combines the traditional craftsmanship of ship model making with the professional knowledge of ship manufacturing, and guides students to make skeleton-type simulation ships. Model, guide students to understand the culture of ships, temper their professional knowledge, inspire innovative thinking, promote the improvement of students' professional ability, and use the attitude of shipbuilding to make ship models to realize the docking of skill training and professional positions. Integrating students' ideological and moral education, professional ability training and comprehensive quality training into the implementation of the project, students have been fully developed in terms of professional skills, "craftsman spirit", and technological innovation capabilities.**

## Keywords

**Professional skills, craftsmanship, technological innovation.**

## 1. Project background

The implementation of the "three-in-one-integration" education model in higher vocational colleges is an important measure to implement the "three all-round education" work in higher vocational colleges, and has important practical value for comprehensively strengthening and improving the education work of higher vocational colleges. This project takes the existing club activities of the Ship Association as the carrier, and takes the simulation craft ship model production as the main implementation object, explores the "production, competition, innovation, and success" collaborative education model, and provides the "three advances and one integration" education model add.

The ship model is a ship model, which is a scale model made strictly according to the shape, structure, color, and even interior parts of the real ship, and is strictly scaled down. The craft ship model is well-made and can truly reproduce the main features of the original ship, which itself contains the ship culture. A set of carefully crafted ship models can completely and truly reproduce the history of a ship company and a ship brand. In our country, the traditional craftsmanship of making simulation craft ship models has been preserved. The simulation craft ship also means smooth sailing and returning home full of loads. Yufeng Life Insurance means a handicraft that is deeply loved by the people of our country.

At present, most of the craft ship models are mainly hand-made. They are filed, nailed, glued, brushed and sprayed by hand. Their models pay more attention to the appearance, color and craftsmanship of the ship, as well as the artistry and appreciation, and the cost of the ship model is high. , And some are even difficult to copy. This project intends to combine tradition, learn from modern shipbuilding methods, and combine professional ship knowledge to produce a

typical ship model series. This series is mainly modern civil ships, covering scientific research ships, oil tankers, container ships, bulk carriers, and engineering ships. The main structure of the ship model is innovatively built in the form of a reduced-scale skeleton of the actual ship, focusing on the professional simulation expression of the internal skeleton structure and components of the ship, so that the content of the entire ship model is fuller, richer and more scientific.

In the 7th National Marine Vehicle Design and Production Competition in 2018, we tried to make this model for the first time and won the first prize. Its ship model has been widely recognized by experts and various colleges and universities. It has been more than a year for ships The association has been improving and perfecting the production method of this model, and initially formed a relatively complete production process. In the future, we will improve and develop on this basis to create a series of ship models with obvious characteristics and typical ship types, so that this type of skeleton-shaped simulation ship model can involve business gifts, product displays, exhibitions, scientific research and teaching.

## 2. Construction goals

This project integrates students' ideological and moral education, professional ability training, and comprehensive quality training into the implementation process, gives full play to the role of quality tutors in associations, and takes into account the academic and entertaining aspects of the second classroom to cultivate students' professional skills, "Craftsmanship spirit" and scientific and technological innovation capabilities are the main themes, and students are trained in four directions: product production, student competition, innovation and entrepreneurship, and high-end employment:

### 2.1. Production:

The product is mainly divided into two parts. Make a virtual three-dimensional model of a typical ship. The size and structure of the model meet the needs of real ship manufacturing. At the same time, the model can be used for virtual simulation, and a set of ship modeling instructions suitable for most civil ships are prepared; real ships of typical ships, etc. The scaled down model, each ship model is equipped with a complete hull structure cutting nesting drawing and each outfitting process production drawing, and is equipped with a ship model production manual, so that the ship model can be accurately copied. The model produced is scientific and rigorous, and can be used as teaching props for teachers. If conditions permit, it can also be made into a disassembled and assembled ship segment structure. With this prop, teachers and students can actually simulate the process of ship processing and assembly, which has high application value in the field of ship education.

### 2.2. Competition:

Relying on the National "Internet +" University Student Innovation and Entrepreneurship Competition, the National University Student Advanced Drawing Technology and Product Information Modeling Innovation Competition, the National Ocean Vehicle Design and Production Competition and the National Vocational College Naval and Ocean Engineering CAD/CAM Skills Competition, based on Students' skills and output guide students to participate in competitions.

### 2.3. Create:

The whole project process enables the student team to have good ship model making skills, the team can set up a studio, and the final research on the ship model making manual can be used as a reference basis for project planning and business negotiation for external orders, so that it can be developed into a Venture Project. The model produced can be modified into a simple

version of the insert model and developed into a puzzle boat model available on the market. At the same time, build a network platform to help students start their own businesses.

#### 2.4. Just:

Strengthen students' professional skills, broaden students' knowledge and vision, and comprehensively cultivate students' comprehensive qualities, so that students can adapt to more corporate positions and dare to compete for higher positions. Recommend students to work in related design institutes, corporate design departments and other business units to help students get high-end employment.

### 3. Construction ideas

According to the technological process of modern shipbuilding, ship design, ship chart drawing, ship production design, lofting, blanking and cutting, structural assembly, outfitting parts production, hull coating and other links are integrated into each step of ship model making. The ship building process guides the production of the ship model, so that the rigid shipbuilding process in the original textbook is presented through the production of the ship model. According to the skills and qualities required by each post in the ship construction process, the ship model production is broken down into several projects, and the students are guided to complete the model production in a project-driven manner, and the ship model is made with the attitude of shipbuilding to achieve skill training and professionalism. The docking of posts. Through the implementation of the project, students have been fully developed in terms of professional skills, "craftsmanship spirit", and scientific and technological innovation capabilities.

### 4. Key measures

Give full play to the professional expertise of quality tutors, guide and train the professional skills of higher vocational students, and improve their professional qualities; at the same time, quality tutors are also specialized teachers and have unique advantages in ideological guidance and political education of students. Quality tutors with expertise advantages are more likely to be accepted and recognized, respected and trusted by students, and are more likely to achieve the effect of "being close to their teachers and believing in their own way". Throughout the development of the project, the instructor's rigorous, meticulous, and striving attitude towards the production of model works, and his pragmatic and innovative work style will always affect the students. These are either explicit direct education or invisible Subtle influence will make students feel the essence and connotation of "craftsman spirit".

To make such a ship model, the connotation of the whole process can be summarized into the following four elements: human, environment, material and method.

People: people involved in making ship models. Should master: computer CAD drawing, three-dimensional modeling, process processing, electrical and electronic, material application, coating and bonding, modeling and carving, cost accounting and other basic knowledge and basic skills. This is often achieved through the quality structure and combination of ship model team personnel. The instructor will consolidate the students' professional knowledge according to the plan, and guide them to master the operation of AutoCAD, CATIA, SOLIDWORKS and other software and various equipment. These software and equipment are not only necessary conditions for model making, but also regular tools for enterprise production. , It is extremely beneficial to the mastery of students' skills.

Ring: The environment for making ship models, including the equipment and tools for making ship models. This is an important means to solve the difficulty of production and to ensure the level of workmanship. At present, the School of Shipping has a national training base, laser

cutting machines, 3D printers and other equipment, which can solve the core equipment conditions and site problems.

**Material:** The material used to make the ship model. The selection of materials for the ship model is very wide, and you can give full play to your creativity without sticking to one pattern. At the same time, you should choose materials flexibly according to the shape and force characteristics of each structure of the ship model. But the four principles of material selection are still: low cost, easy processing, high quality, and strong texture simulation. The basic materials we plan to use include solid wood board, linden wood board, gypsum, stone, ABS plastic, PVC board, plexiglass, etching sheet, etc.

**Method:** the method of making ship models. The production method is to first perform three-dimensional simulation modeling of the ship in CATIA, SOLIDWORKS and other software, and then design the model from the professional perspective of ship production to obtain the required production process drawings, then cut through special equipment, and finally assemble Gluing. The whole process forms a set of "Ship Model Making Guide", which makes the model more professional and scientific, and can be copied. At the same time, the "Ship Model Making Guide" plays a very important role in the production of ship model makers, competition activities, and business negotiations.

Quality tutors give full play to their own network advantages, build a network of senior engineering executives, industry classmates (mentor classmates), college teachers, outstanding graduates, etc. for students to promote the organic alliance of industry, learning, research, and innovation, so that students can There are opportunities to approach the frontiers of the industry in a diversified manner. Professionals from industries and companies can also come to guide the progress of the project and help students' overall development and employment.

## 5. Project Features

### 5.1. The implementation of the project achieves three "consistents"

The entire ship model integrates simulation, viewing, and science, and has three characteristics consistent with the actual ship:

The appearance and structure of the ship model are consistent with the real ship, and the art and beauty of the craft ship model is reflected on the basis of ensuring the simulation of the ship model (that is, the overall appearance is consistent with the real ship, and the internal structure is consistent with the real ship);

The ship model making drawings are consistent with the actual ship design drawings, and the model is made with the drawings of the scaled design, which can accurately ensure the size, size, and shape of the model structure, and present the science and simulation of the ship model; The craftsmanship of the ship model is the same as that of the actual ship. A ship model completely simulates the construction process and procedures of the real ship to ensure that the production steps are standardized and rigorous.

### 5.2. Project-driven, job docking

According to the technological process of modern shipbuilding, ship design, ship chart drawing, ship production design, lofting, blanking and cutting, structural assembly, outfitting parts production, hull coating and other links are integrated into each step of ship model making. The process of ship building guides the production of ship models. According to the skills and qualities required by each post in the ship construction process, the ship model production is broken down into several projects. Each project contains the core skill requirements of the actual job position for talents. Students are no longer purely playing by hobbies. , But through the training of core skills to solve the key and technical problems of model making. In this way, the students are guided to complete the model making in a project-driven way, which makes

the students feel interesting, and at the same time cultivates the overall quality, and realizes the docking of skill training and professional positions.

### 5.3 Give full play to expertise and educate people with characteristics

Throughout the project implementation process, professionally embodied the ship design process and construction technology implementation. Teachers can cultivate students' solid professional knowledge and basic skills; in terms of quality and ability, they cultivate students' sense of teamwork and temper their hard-working character. Shape students' work attitude of striving for excellence, guide students to think innovatively, overcome difficulties, and achieve full education and all-round education.

## 6. Promotion value

### 6.1. Promote production, competition, innovation, and collaboration education model

Cultivating technical and skilled talents is the fundamental task of local vocational colleges. It is to build a talent training platform for production-competition-innovation-based collaborative education, optimizing multi-resources, enhancing the connotation of shipbuilding, and developing professional characteristics based on the comprehensive development of students. It is an important measure to implement our school's "three holistic education" work, which will help higher vocational colleges to further deepen the education concept of morality, integrate the education resources of higher vocational colleges, and cultivate all-round development of higher vocational talents. And improving the education of higher vocational colleges has important practical value.

### 6.2. Promote student innovation and entrepreneurship

The model produced has a good viewability. Through the careful carving of the ship model, it can be used for business gifts or exhibitions in the exhibition hall, and can also be turned into a simplified version of the puzzle and insert ship model, which will benefit the majority of model lovers. According to the formed and standardized production process and technical manual, the project team can set up a studio to undertake external business. At the same time, build an online sales platform to let the products go out. This will give full play to the "activity, incubation, and training" functions of innovative and entrepreneurial student groups, and play their role of "gathering, leading, demonstrating, and radiating", so that more students have the courage to start their own businesses.

### 6.3. Promote high-end employment for students

We will give full play to the characteristics and advantages of the School of Shipping of our school, and promote local cooperation in a solid and effective manner through a talent alliance that connects industry, learning, research, and innovation. Continuously improve the form of cooperation, the scope of cooperation, and the level of cooperation, establish a new model, promote the common development of multiple parties, and promote high-end employment for students.

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