

# Research on Practical Teaching System of “Production, Learning, Creation and Application” for Marine and Ocean Engineering Specialty

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**Abstract:** Under the background of the continuous improvement of China's economic development level, China's Marine industry has also shown a rapid development trend, modern ocean engineering has put forward higher requirements on the professional level of engineers and technicians. In order to strengthen the teaching quality of Marine engineering and Marine engineering, it is necessary to implement the integrated practical teaching of "production, learning, creation and application", so as to cultivate more high-quality applied technical talents. Based on this, this paper mainly analyzes the countermeasures to carry out the integrated practice teaching of "production, learning, creation and application" for Marine and ocean engineering major, hoping to provide reference and reference for relevant people.

**Keywords:** Shipbuilding and ocean engineering "Production, learning, Creation and Application" integration practice teaching

## 1. Introduction

In the development of the new era, the active exploitation and utilization of the ocean is the key content of the development of the current era. Under the background of economic new normal, it is very important to give full play to Marine advantages and turn them into modern economic development goals. However, it should be noted that Marine talents are in short supply in China's talent market at present. On the basis of this, our country on the Marine cultivation is very concerned about, has set up a number of professional colleges and universities, cultivate a number of professional talents, the strengthening of Marine science and technology innovation and service development and utilization of Marine resources provides great support [1]. At present, the opening and utilization of Marine resources has entered a new stage of development. Although there are many Marine universities, there are relatively few applied talents in shipbuilding and ocean engineering. Therefore, formal and effective measures are needed to strengthen the

effectiveness of teaching of Marine and ocean engineering, and the integrated teaching mode of "production, learning, creation and application" can be implemented to cultivate more talents and provide support for the development of the industry [2].

## 2. Current Practice Teaching Status of Marine and Ocean Engineering Specialty

### 2.1 Lack of Attention to Practical Teaching

First of all, there is a lack of understanding of practical teaching, which tends to be traditional teaching in teaching, namely "emphasizing theory, neglecting practice", "emphasizing classroom, neglecting extracurricular activities"[3]. For example, in the talent training plan, there are not many internship practices for students, and there is no perfect internship guidance plan and assessment mode. Under this background, it is difficult to improve the learning efficiency and effect of students. The other is the lack of internship funds, internship quality is not guaranteed. During the internship of Marine and ocean engineering majors, the expenses of transportation and accommodation are generally high, so the instructors usually make arrangements for the internship with funds as the core in the process of making the internship plan. For example, a Marine engineering school generally focuses on the local shipyard or nearby shipyard for internship, while other universities with sufficient internship funds go to other places for internship, which will lead to the weak professional ability of students.

### 2.2 Lack of Teaching Staff for Practical Teaching

At present, the practice teaching of Marine ship and ocean engineering is basically carried out by young teachers. Although such teachers have a high degree of education and professional foundation, it should be noted that they are difficult to be competent for professional practice guidance due to their lack of practical training and exercise. In addition, compared with classroom theoretical teaching, practice guidance outside should contact with many shipyards, which is relatively complicated and troublesome, and the whole process needs to bear the

production safety responsibility of students in the practice stage [4], so many teachers are reluctant to undertake practical teaching tasks. At the same time, in terms of the existing assessment system of some colleges and universities, there is a phenomenon of emphasis on scientific research, and there is no perfect assessment system of practical teaching, which leads to the difficulty of effective evaluation of practical teaching [5]. In the long run, it will affect teachers' attention to practical teaching.

### 2.3 Enterprises lack the Initiative to Participate in Practical Teaching

At present, the enrollment scale of colleges and universities is constantly expanding, which will bring great pressure to enterprises to accept students' internship. In this context, many enterprises are reluctant to accept students' internship from colleges and universities [6]. The main factors are safety concerns and affecting the normal production of enterprises. And part of the reason is the enterprise in the production stage is usually to economic efficiency as the primary consideration standard, and students to the factory practice is not to bring help to improve the economic benefits of the enterprises, even will directly affect the enterprise normal production order, and brings the certain effect to the enterprise economic development, so many enterprises to recruit interns a negative attitude. In addition, also the lack of all-round cooperation between between colleges, in recent years, the cooperation between schools and businesses are basically remain in the student internship unilaterally, practice content is relatively single, also in the process of the enterprise did not know and aware of university-enterprise cooperation on the importance of strengthening its technical strength [7], nor with the help of the student internship for enterprise itself.

## 3. Thinking on the Integrated Practical Teaching System of "Production, Learning, Creation and Application" for Marine Engineering Major

### 3.1 Innovate Practical Teaching System

In terms of the innovation of Marine engineering practice teaching system, attention should be paid to the training of applied talents, which can be carried out from the following four aspects:

One is the integration of industry and education. The integration of industry and education includes teaching system, teaching team, teaching resources and talent training program. Before students enter the enterprise, they can improve the ability of students by improving the content and sequence of courses. In view of the particularity of the shipping profession, the school can negotiate with the enterprise, and then formulate a tripartite agreement to further clarify the rights and interests of students in the internship stage, so that students can have the right to choose employment consciously in the future.

The second is the integration of academic research. At this stage, students are required to participate in the research team of ships and ocean engineering, so that they can participate in the project of teachers, which is of great

help to improve students' professional ability and comprehensive quality. In addition, schools also need to innovate scientific research in accordance with majors to provide strong support for students' professional learning and development.

Third, it is designed to create harmony. Creative integration mainly includes the cultivation of innovative ideas and engineering literacy. In terms of the cultivation of innovative ideas, it is to improve students' innovative desire, innovative thinking, innovative methods and innovative ability. In the process, we can use the method of integrating theory and practice to carry out teaching, so that the learning of basic principles and practical operation can be carried out at the same time, so that students can improve their innovation consciousness in the continuous practice and exploration. For engineering quality, should be to develop students' knowledge of engineering quality and engineering thinking quality, engineering practice and engineering innovation, etc., can carry out basic subjects in the process of experiment and computer simulation, the former mainly for physical experiment and metalworking experiment, the latter emphasize shipbuilding technology and safe operation of Marine technology and exploration technology study, This requires students to fully grasp the mechanics content, which can be carried out by means of technical experiments.

The fourth is the third step. The construction of professional course group system, innovative practice system and comprehensive training system, so as to realize the overall planning, joint construction and multi-discipline and multi-specialty sharing of the teaching of shipbuilding and ocean engineering.

### 3.2 Improve the Practice Training System and Strengthen School-Enterprise Cooperation

In the stage of personnel training, the teaching mode of personnel training should be optimized. On the basis of on-campus teaching, off-campus practice teaching should also be carried out. In the on-campus practice teaching, professional teachers should arrange practical teaching according to the actual development of the industry and the characteristics of the discipline, such as innovation practice, welding process practice and ship repair practice, etc., to ensure that students can experience the difficulties in the actual work of the on-campus factory practice. Then according to the campus practice platform to develop the experimental outline, so that students can carry out the practice operation step by step, in the long run, the students' hands-on ability can be strengthened. In addition, for the construction of off-campus practice system, the school needs to set up a number of contents such as cognitive practice, production practice and graduation practice for students according to their learning situation, and the whole process should be arranged scientifically. Both of the above two practical teaching modes need good cooperation between the school and the enterprise, so that students can understand the technology and production concept of the enterprise, which is of great help to strengthen students' perceptual understanding of professional learning. At the same time, students can also

go deep into the enterprise and intuitively understand the whole working process, such as design, steel processing and section manufacturing. In terms of some professional skills, such as shipbuilding production management and shipbuilding inspection, students can also carry out practical operation. In addition, in phase of personnel training, colleges and universities can also be equipped with the enterprise and enterprise cooperation for student to school professor knowledge, such not only can realize the fusion of theory teaching and enterprise practice, students can put forward to enterprise mentors themselves in the daily learning don't understand the question, under the fusion between colleges of ship and ocean engineering specialty teaching can improve students' skill levels, So that students become application-oriented talents.

### 3.3 Actively develop Practical Teaching Bases to Provide Practical Teaching Conditions for Students

The development of off-campus practice teaching base is an important means of teaching shipbuilding and ocean engineering in colleges and universities, as well as one of the key ways of personnel training. Although this oriented talent training mode lacks flexibility, it should be noted that this talent training mode can accelerate the realization of professional development goals. At present, many universities have set up the ship and ocean engineering, and there are also some fixed professional colleges and universities, the professional colleges and universities are basically located in the economy is relatively developed coastal areas, therefore, can use its good geographical advantage and Marine resources to establish practice teaching base, this will increase the students' practice, students will have a broader development platform. After the establishment of professional practice base, colleges and universities need to establish talent training plan according to the needs of industry development and students' ability and practice situation. At the same time, practice demonstration should be done well in the concrete practice stage. For example, in carry out ship safety performance test in the process of practice teaching, professional operation, the teacher should first experiment is turning performance and steady performance of the ship and inertia navigation of ships, etc. [8], after the completion of a teacher should guide students collected experimental data, and then through data processing to the analysis of ship safety coefficient and the influence factors of ship safety. Through this practice teaching mode, students can not only fully grasp the influence of ship safety performance pharmacy, but also understand the analysis method of ship safety performance test, and then fully realize the goal of practice teaching.

### 3.4 Train a Team of Teachers Who Integrate Teaching, Creation and Action

In the teaching of ship and ocean engineering in colleges and universities, high-quality teachers are the key factors to realize the teaching objectives of practical courses. For the establishment of the integrated teacher team of "teaching, creating and doing", teachers are required to have strong professional and technical abilities. Teachers

are not only required to master basic professional knowledge, but also have strong language expression ability, systematic analysis ability and problem solving ability. Therefore, in this context, professional teachers should go deep into the Marine teaching base for practical exploration, and schools should regularly carry out technical training for professional teachers and actively encourage professional teachers to participate in national competitive contests, so as to strengthen their professional quality and practical teaching ability. In addition, still need to improve the professional teachers' rewards and punishment mechanism, in the practice teaching ability in terms of the relatively poor teachers, need to be modified, can also let the field study into practice base, strengthening teachers' weak skill, such ability can by sea and Marine engineering professional teaching more effective in conveying has the ability of teachers, It can also strengthen the effectiveness of professional practice teaching.

## 4. Conclusion

To sum up, under the background of economic new normal, the major of Shipbuilding and ocean engineering can be said to be the key to the study of China's Marine economic development, which has a great impact on China's social and economic development. Therefore, the major of Marine engineering and Marine engineering needs to innovate the teaching system and carry out teaching with the help of the integrated practical teaching method of "production, learning, creation and application", which can well cultivate students' comprehensive ability. Based on the characteristics of ship and ocean engineering, the theory of single teaching is difficult to meet the needs of subject development, should attach importance to cultivate applied talents practice, in the process of the factors: can use to guide students to participate in the practice, on the basis of students' theoretical knowledge, to further promote its practical operation ability of ascension, This has a certain effect on the training of professional applied talents.

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