

## Shipboard Training for the Efficient Maritime Education

Chung Do Nam (Korea Maritime University)

### Abstract

Marine officers should have crisis control ability because ship operation needs not only highly specialized information, but also functional capability due to the fact that there always exist dangers at sea, which are different from those at shore.

Therefore, marine officers should be trained on the related specialized information under the systematical educational system including shipboard training. Their training is also based on the strong spiritual power and physical strength through the strict training process.

In order to have these vocational personalities, dormitory life training and shipboard training courses seem to be essential processes, which are required of maritime education.

The introduction of automatic system into the ship as a result of the recent development of technology brings decrease of the full number of crew. Consequently, marine officers are increasingly under heavy burden, and should have more ship operation capabilities than before.

Marine officers should have not only specialized information which differs from that at shore, but also vocational adaptability which can reasonably tackle with all the problems which exist on the spot and are obstacles to individual, spiritual, physical, natural, and social demands.

There are many areas to deal with as extra curricula, which are unique characteristics of the education for marine officers. These vocational adaptabilities are based on the spiritual characteristics, such as self-developmental education, responsibility, meticulous care, attentiveness, voluntary, planning, readiness, spontaneity, accuracy, self-denial, obedience, leadership, and etc.

Furthermore, duty officers are solely responsible for the safety of their crew's lives and properties, they should train their students every day with safety supervision through the training process to cultivate vocational personality of marine officers for the safety control and economical operation of the ship.

### 1. Introduction

For the last several years, there have been big domestic changes around environment of KMU, for example, educational reformation of the university for the enforcement of national competitive power, requirement of the society based of knowledge according to the new educational process, structural change of population, an evasion and secession tendency of science and engineering communities of the student, conversion of the social cultural paradigm, a change of vocational view, and an environmental change in seamen power etc., and it has been also to be strengthened STCW convention internationally for its performance for marine safety and protection of marine environment.

On the part of the shipping industry, as the goods change to make into compact from the 1st industrial products, shipping has been transferred to the type of container ship, LPG vessel, LNG vessel and etc. of which are added and technical intensive one.

At the other side of engineering part, it has been changed to automatic, to make into high power and maintenance free, so it is required the more expert skill for the marine engineer.

For the present it is found that 7700 TEU container vessel are under operation, and 15000 TEU container ship will be at the examine step for its design

As the shipping industry needs various knowledge and technique and sea experience for the safe and economical ship operation, though it is weighted to the theoretical, spiritual side, to meet high technical development on the shipping industry, sea service working is required (needed) responsibility, self confidence, a self-denying spirit and etc. due to an unexpected case. It is essential that seamen are practical exercise and discipline for the education and training.

Therefore, all intelligence, justice and the body together should be cultivated in order to train a technical expert performing his duty effectively.

And so, all views of intelligence, justice and the body should be considered in human education.

Since the basic object of training in a training ship is to cultivate the power of execution and adaptation, it is important to possess the active will always for its acquirement.

Consequently, though the mental and physical power should be trained in order to possess the power of execution, navigational technology can be achieved by the various methods such as repetitive practice, experience, memorization and understanding and so on.

In a viewpoint that the students in a training ship are educated with living in a limited space, the education method is different from education at school, that is, just 24-hour education itself.

Therefore, only technical education should not be concentrated in a training ship, but it must be trained on a basis of living education.

## **2. Characteristics of the Maritime Education**

### **2-1. Characteristics of the Sea Service Environment**

The sea service environment on board is inferior to the shore one. The typical characteristics of the sea service environment are as follows:

- 1) The attitude of provision against a disaster at sea is required since the ship at sea is always exposed to danger of collision, stranding, sinking, and a fire and so on.
- 2) An absent-mindedness and a trifling error can not be unpardonable generally to the officer on duty of a ship because he has a heavy responsibility for the maintenance and the management of the precious life and the important property.
- 3) When an accident happens on ship, it must be treated separately without external assistance. And also the exact and proper treatment according to the circumstances is required in an emergency.
- 4) The seaman is easy to be under stress mentally and also to be tired physically due to a restrictive life in a limited place, which is a ship, isolated from a community and home.
- 5) The professional knowledge and the skill in a high degree are required to the economical navigation management because a ship is a composition plant integrated with various techniques of the different fields.
- 6) The seaman must follow the instructions of his boss in a sea service and obey the order of his boss absolutely in case of emergency.
- 7) The seaman must know the relevant facts well about the international law and the environment preservation since his ship calls at the international ports.

### **2-2. A Talent and Ability of a Marine Officer**

A talent and ability, which a seaman must have as a manager in order to perform his duty faithfully, are as follows:

- 1) A high professional knowledge necessary to the ship operation management and a technical skill through the repeated field training
- 2) Precaution and carefulness against potential of danger and an ability of its treatment when an accident happens.
- 3) Collaboration and leadership through living in a group
- 4) Neatness, arrangement and responsibility through moderate life under critical regulations
- 5) Time observance through leading a regular life
- 6) Strong mind and physical power through the various repeated training
- 7) Courtesy and education in human relationships.

## **2-3. A Feature of Maritime Education**

In order to train marine officers of talent and capacity required in a sea service, maritime education has characteristics as follows:

- 1) Completion of various courses necessary to the ship operation management: basic science, applied science, social science, and language etc..
- 2) Completion of courses necessary to obtain standard qualification: various basic educations provided by the international convention.
- 3) Adaptation, self-restraint and leadership in a specific environment through organizing billet living and systematic training, and also cultivation of seamanship through developing a healthy sense of values
- 4) Field education through embarkation training
- 5) Cultivation of treatment ability against danger in an emergency through training

## **3. Shipboard Training Education**

### **3-1. A Purpose of Shipboard Training Education**

In order to train basic knowledge and skill required of the seaman, the purpose of shipboard training education is to cultivate both theory and practical business in harmony with practical embarkation training, and also to train ability and adaptation necessary to conducting business given in peculiar environment.

It is described in detail as follows:

- 1) It is to increase understanding of professional knowledge and to promote its ability to use through practical experience.
- 2) It is to prepare for danger all the time, to encourage his responsibility based on continuous attention and precaution for safe navigation, and to cultivate management ability for economical operation management of a ship.
- 3) It is to cultivate treatment ability of an accident without confusion in an emergency after grasping its situation immediately and exactly.
- 4) It is to learn efficient operation, safety management and repair techniques of equipments.
- 5) It is to grasp overviews related to shipping industries and to cultivate his ability as a manager in a practical ship in future by being directly in contact with the officials in charge of the shipping companies, the agencies and the related enterprises.
- 6) It is to make him possess a good heart and morals as a manager through living on board a ship, and also to broaden his international sense in a management aspect by understanding the culture of the country when he calls at the other foreign ports.

### **3-2. Types of shipboard training education**

Shipboard training education can be classified according to its execution method and time as follows.

#### **3-2-1. Classification of shipboard training education**

There are two methods of shipboard training education in which one method is to use an exclusive training ship and the other is to contract a commercial shipping company for training. The respective features are described as follows.

- (1) Training education in an exclusive training ship
  - 1) It is possible to be linked with a regular schooling and to train by the exclusive training professor systematically and organically.
  - 2) It is possible to cultivate a fellow feeling, cooperative spirit and respect for law through group life and

regulation.

- 3) It is impossible to train cargo navigation and difficult to train disassembly service of various kinds of equipments.
- 4) It is difficult to accumulate practical experience and to have self-confidence because of insufficient practical opportunity due to group training.

(2) Training education by contract with a commercial shipping company

- 1) It is possible to apply knowledge obtained by practical training to a practical business immediately because of field training, and to cultivate self-confidence.
- 2) It is possible to learn training assignment immediately and understand each system and various equipments wide because many training opportunities are given to each trainee.
- 3) It is impossible to be linked with a regular school education, and there is a great difference of training effect according to enthusiasm and ability of field seaman trainer and also depending on human relationship.
- 4) Systematic education such as group training and so on is impossible and there are no opportunities of cultivating seamanship through such education.

### 3-2-2. Classification of training time

Training time can be classified as a multi-step completion type and a continuation type.

1) A multi-step completion type

It is possible to increase the education effect by dividing regular training period on board a ship (usually one year), and then by training basic education necessary to seamanship and shore education according to progress stage to various different functions. There is more-or-less difficulty in practical use of a method and a curriculum adopted from the developed countries such as England, France, USA and Japan.

2) A continuation type

The practical use of a curriculum is easy as a method of completion of embarkation training continuously at one time. Republic of Korea, Philippines and Taiwan adopt this method, and training on board a ship is required after graduation in Taiwan and Philippines.

### 3-3. The present state and problems of shipboard training education

By the STCW regulation navigation department trainees should have one-year shipboard training experience, and engineering trainees should have six-month experience. So training ship "Hanara" was placed for the students of navigation department of KMU since 1994, and the old training ship "Hanbada" was placed only for the students of maritime transportation department and engineering department. The students of engineering department are trained at machine factory for one semester between spring semester and autumn one as replace of shore service training for 6 months. The fact is that the training education is not effective due to insufficiency of training equipments. In spite of two training ships in service, the education in the training ship also is not effective due to the limits of accommodation (accommodation capacity: Hanbada-174 students, Hanara-152 students). Therefore, in order to improve the training effect, the number of students in the training ship must maintain at optimum level by taking a share in commission training companies, simulation training introduced in future and training at machine factory must proceed together properly and consistently.

#### 3-3-1. The problems of commission training by a contract shipping company

Before entering a training ship "Hanara" in service, the commission company trains some students due to insufficiency of accommodations of an existing training ship, accordingly there happen various problems such as training conditions including expenses and indemnity in an accident. After all, shore training of half of the students in machine department alternately at machine room during one semester

and accommodations of two training ships have solved the commission training problems by external companies. However, in view of overpopulated training education in a field, it can be considered that commission training of some students by external companies should be resumed gradually in order to bring practical training effects.

Judging from previous experiences, training condition is much different according to circumstances of each company. Generally speaking, the large companies have much interest in trainees. Some companies install education facilities on the newest ship in service and provide some students on summer vacation with training opportunities as well as self-education. However, it seems that systematic and organic training is not given by other companies except some large ones.

The problems in previous commission training by external companies are classified as follows:

- 1) It is difficult to train effectively on basis of theory because of no preparation of sufficient professional knowledge.
- 2) No sufficient time is given to trainees in making a training report.
- 3) It is difficult to set the student's time to the schedule of a ship since the training period is 6 months usually. And also it is difficult to say that six-month training is enough to get practical knowledge.
- 4) It is difficult to evaluate each trainee in all training considering only the submitted assignments, and impossible to give a grade if there is a mail delivery accident.
- 5) It is impossible to give an instruction by university.
- 6) Costs in safety training necessary to embarkation are a burden.

### **3-3-2. The present state and problems of training education in training ship**

In training curriculum, after a basic living course is taken in the first one week, the education period is divided into coastal navigation training and overseas navigation training. Coastal navigation is given by nearly 6 times a year, and the essentials in navigation are achieved through navigation of national coast monthly in 3 or 4 days at the beginning of the week. After some basic training is achieved through several times of coast navigation training, overseas navigation training begins. In navigation training, 4 groups of navigation on duty are arranged together with students in navigation department and machine department. 3 groups of them are placed in navigation training and the other groups are placed in day-work, accordingly they can experience and learn duty services and working methods practically. Anchorage training is given during about a month after finishing basic training course and the other period except navigation training, and consists of education in a classroom and field training in each course.

The problems in training on board a training ship are as follows:

- 1) It is difficult for a trainee to operate equipments directly and sufficiently for training purpose during navigation.
- 2) The quality of education and training efficiency decrease and personal training opportunity is insufficient because many students are accommodated in a small space.
- 3) The education tends to be disconnected due to short period of navigation.
- 4) Students are apt to be passive because of lack of reality.

## **4. The improvement methods of training education**

### **4-1. In case of commission training in a commercial ship**

No problems yet, however, a training manual according to the ship's type being referred in a field must be developed in case of resumption of commission training in near future. At one time, a training manual published by professors in both navigation and engineering departments was used for trainees. But the system and the content of the manual are somewhat different from practical aspect in a field, moreover, it became useless by students because training assignments were referred to the other materials.

In case of commission training by external companies, school makes an effort in cooperation with them for the training managers to teach students effectively after grasping the training purpose completely.

In case of training evaluation, there happened some confusion at one time due to the absence of the training manager in a training ship but by professor in shore education. Moreover, there is some difficulty in proper evaluation of practical training results because it can't help but evaluate the results by referring only to the submitted assignments. Therefore, it should be considered that an effective training manual needs to be developed by introducing the system of training management professor and also the proper system is needed to evaluate the training results effectively.

#### **4-2. In case of training in a school training ship**

In case of no training by the external commission companies but training in two training ships, there are no formal problems even in the present system. However, it is not easy to train too many students at the same time and also effective training can not be expected. Therefore, it is highly effective to entrust a commission company with excessive students except accommodations suitable to train in two training ships. And also training effect can be achieved by installing simulators and equipments on shore since operation of navigation system, handling method of cargo, and disassembly and maintenance of various equipments are difficult to handle in a real ship for training.

#### **4-3. In case of commission training in a contract shipping company after some periods of training in a training ship**

A complementary method to solve the training problems, as described in sections 3-4, both in a training ship and in the external commission companies is to complete training by the external commission companies after training in a training ship in some period. The effective training can be expected by this method.

### **5. Conclusion**

Shipboard training system that is currently being operated is considered to be quite problematic in itself in spite of the fact that lots of improvements have been made so far. In order to solve these problems, all the people in charge are required to continue their research and studies hard.

Shipboard training occupies a large part of quality education. However, there are lots of things that have to be improved and reformed especially in the area consisting of three inevitable elements in training: cadets, lecturers, environment, shipboard training. First of all, shipboard training must create the proper surroundings that encourage students to commit themselves to learning and mastering the knowledge and academic achievements very effectively through providing a good education. To do this, people in charge of training are surely required to create the learning environment for better academic advancements and its systematic changes should be followed subsequently.

In addition, when dealing with the matters of shipboard training education, improvements of training environment are urgently needed and its effectiveness is useless without any budget expansion and developments of equipment and facilities that can be available during anchorage.

For further development of model for shipboard training education, we should further study and research things that follow.

1. How to operate the training ships
2. To make changes for multi-level based system regarding training periods and times
3. Parallel management of training ship training and merchant ship training
4. Systematic training method of courses and curriculum tailored to each department.
5. Development of training guideline.

Academic affairs that have been managed by Ministry of Education so far, as a part of education reform plan under the government policy, now appear to be revised in the near future, which will secure less restricted and more tailored academic policy depending on the circumstances of each school in terms of the credit rule, credits needed to graduation, taking credits per a term, standard of distribution for cultural studies.

University regulation, in the case of college of Maritime Science, stated that required minimum credits for graduation are 160 and in fact it has not had a good influence on students because they have not been able to stay away from machine shop practice and formula of the education in the lecture room. From now on it is considered to be quite necessary that credit system be balanced with lots of leading universities of home and abroad in order to diversify students' way long before graduation and if possible, we should adjust the relevant regulation increasing completing credits and reducing total credits needed to graduation at least in the area of quality education. In order words, through introducing PASS, we will be able to have On-the-job based training so that we can achieve more effective education.

With the introduction of multi-level training system designed to provide students in each grade with shipboard training for about 2 months a year, we are able to make up for the weak points of continuous type and achieve more flexibility on managing the regulations of total required credits for graduation.

We can further achieve mutual-supplemented system of training ships and materials needed to practice through developing various training systems that offer simulated situation such as ship handling practice, backup capabilities under blackout and emergency case, all of which do not actually often take place.

We also promote safety program by making preventive measures against any dangerous elements on board and give practical opportunities to manipulate and work with various kinds of equipment and facilities, which ultimately encourage them to understand what they are learning better and grow their confidence and commitment to this field.

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