

## **Meeting the requirement and development of Maritime Education and Training**

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### **ABSTRACT**

Maritime Education and Training (MET) evolves along with the fast development of maritime industry. It faces with many new requirements in the progress of such an evolvement, such as the requirement on further enhancement of seafarers' practical skills and ability under the new STCW'95, the requirement on the introduction of new training items such as Electronic Chart Displaying Information System (ECDIS) and Bridge Resource Management (BRM), and other requirements and demands from maritime industry.

The process of meeting those requirements can be seen as new development of MET. Various difficulties and problems are encountered in such a process. The essay analyses in depth some of them that MET is now facing with, focuses on: 1) How to meet the requirement of STCW'95 on the increasing of seafarers' practical ability? 2) How to keep pace with new maritime development in terms of maritime technology and maritime management science applicable onboard ship by adjusting their curricula and educating systems? 3) How to enhance the capability of fast responding to various needs of the maritime industry?

The essay comes up with some constructive solutions based on the above analysis in the light of successful experience in STCW implementation and MET management. In its final summarization, it stresses on the application of a comprehensive way for a satisfactory solution to all the above-mentioned questions and problems.

Key words: MET, CBT, Curricula, Training, Teaching, Maritime, Education, Management

### **1. Introduction**

MET is facing with many new requirements, and those can be seen as new MET development: 1) MET should make effort to enhance further the seafarers' practical ability and skills as required by STCW'95. 2) MET institutions have to involve newly-emerged training subjects and items in both maritime technology and maritime management science aspects into their curriculum systems, such as ECDIS, BRM, multifunctional VTS. 3) For those countries interested in crew-manning supply, the quality of their MET is one of the main factors affecting the competitiveness of their seafarers in crew-manning market. So the additional requirement for those institutions is that they should place special importance on the capability and rapidity of response-making so as

to react fast and correctly to different demands from the manning market.

For those pursuing higher education and training quality and more competitiveness, more subjects and items have to be included into their curriculum system.

To sum up, the development of MET in future encompasses on the following aspects (but not limited hereto) while taking constructing a more effective and efficient MET as a whole goal.

1. To keep theoretical education and practical training simultaneously, while the latter to be paid with more attention.
2. To keep maritime education and training the same pace with the development of maritime industry, which includes both the development in the respect of maritime technology and maritime management science, and to make sure those achievements to be fully and correctly applied onboard by equipping students/trainees with above achievements.
3. To build up and reinforce the response-making capability of educating and curriculum systems in order to suit various needs

It should be pointed out that the essay looks at only those problems having been met with in the above-mentioned MET development. Meanwhile, all the discussions and analysis in this essay are based on understandings and practices in a context of MET institution management, not training centers engaging in short course training, intensive training, etc.,

## **2. Problems being put forward and analysis**

However, after a few years of STCW implementation and pursuing the above, i.e., future development of MET, quite some problems have been identified, including but not limited to the following:

- a. Difficulties and problems exist in full fulfillment of STCW'95 requirements on the enhancement of seafarers' practical skills.
- b. There is a lack of capability within the MET institutions in the respect of new subject designing and deployment, and a lack of capacity of curriculum adjustment, while maritime technology and management science keep evolving.
- c. There is a shortage of capability, where MET institutions are working in market scheme, of fast response-making to the demands from crew-manning market, also owing to the lack of capability of new subject designing and deployment, the very limited capacity of curriculum adjustment, etc.

So to summarize, the key problems are: 1) how to enhance the seafarers' practical skills? 2) how to enhance the capability of response-making and the flexibility of an educating and curriculum system?

### **2.1 Problems encountered in meeting STCW'95 requirements on the enhancement of seafarers' practical skills**

The usual way of implementing such STCW'95 requirements can be illustrated by the figure 2-1. Theoretical education goes first, then practical skill training, which can be done by simulator training, CBT and onboard training. The final stage is assessment and examination.

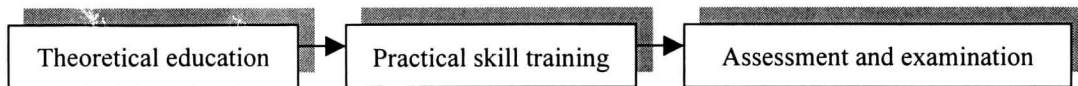


Figure2-1

The problems arisen in the above process are: 1) new demand on the training facilities due to more practical training as required, causing possibly funding problem. 2) with the joining of or more practical training, the workload for the whole process increases and the hours required for education and training expand as well. These cause consequently problems to teaching staff and training infrastructures. On the other hand, if the whole workload and hours have to be controlled, then other problems may be caused such as complaints from teaching staff and the imbalance between theoretical education and practical skill training.

As to the problem regarding the new demand on training facilities, for MET institutions in major shipping countries, the average cost contributed to each trainee is quite high due to small number of trainees since a procurement of new equipment or building of new facilities usually requires large investment. So the necessity of such a procurement or building has to be detailedly taken into account. For crew-manning supply countries, the problem is the shortage of funding, although the trainee group is usually large enough. Anyway, the funding problem does exist in many cases.

Simply adding practical training to the theoretical education is not realistic. For most of MET institutions, it is regulated by education authority that the whole education and training hours cannot be exceeded excessively. Consequently, each subject or training item should be done in given hours.

Both theoretical education and practical training are required in many subjects or training items. To give prominence to the practical training as required by the convention, the practical training is now occupying more percentage of hours given to a certain subject or training item. The theoretical education hours therefore has to be shortened to a certain extent. This causes problems: Quite a number of instructors complain nowadays insufficient hours for theoretical teaching. Apparently, insufficient theoretical teaching can affects disadvantageously the practical training.

So the final question is how to secure the effective fulfillment of both theoretical teaching and practical training, while not adding new education and training hours?

## **2.2 Problems encountered in meeting the development of new maritime technology and management science**

New subjects and items are emerging, such as ECDIS, AIS. Meanwhile, a new trend can be seen in maritime industry in recent years, that is, maritime management is attracting more and more attention. Many newly-emerged management subjects or subjects of that nature, such as BRM, FSA, onboard management, are understood as an effective way leading to more effective and efficient maritime operations. They are also understood as a promising and significant way of eliminating maritime accidents, especially human errors. More and more shipowners stress on the necessity of their employees onboard to be equipped with enough management knowledge and skills. All these should be introduced into MET institutions' curricula.

However, it is not easy to introduce a new subject or training item into educating and curriculum system.

Problems exist in: 1) new demand of training facilities and the expanding of education and training hours, which have been discussed in section 2.2. 2) slow responses that educating and management system make towards the emergence of new subjects and training items. Further analysis reveals more detailed reasons:

a) the introduction of a new subject or training item under Quality Management Scheme needs to go through many formalities and takes time. The procedure for an introduction is generally divided into two stages, i.e., the curriculum designing and incorporation of the curriculum into educating system. (figure 2-2).

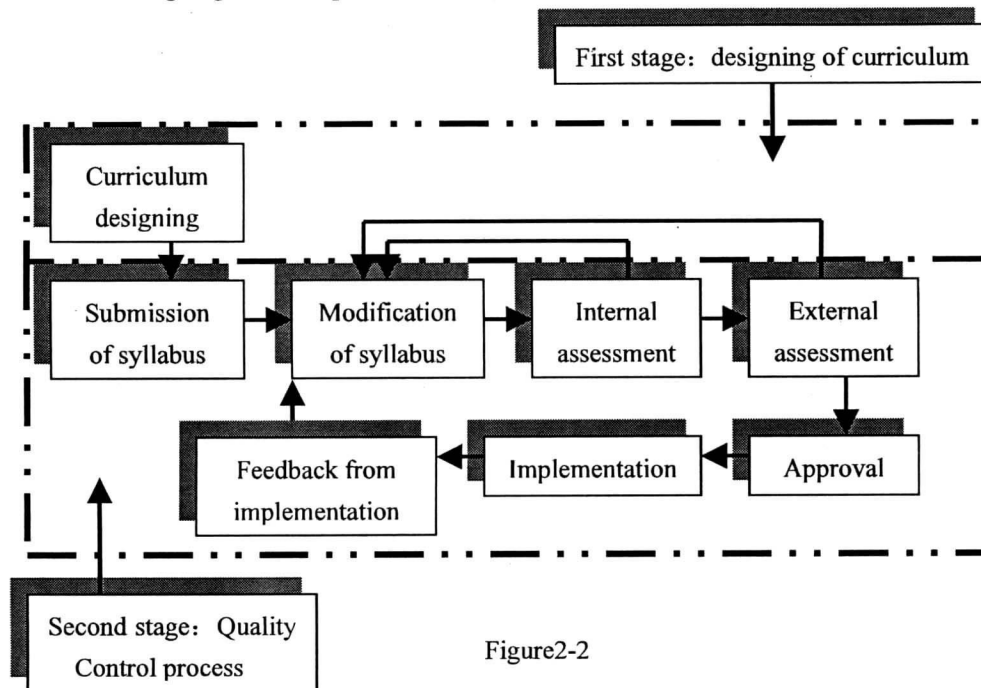


Figure2-2

b) possible inconsistency between different departments and sections, delay of funding, shortage of human resources and other various resources, etc.,

3) once failed to perform the above procedure, the problem becomes the difficulty to adjust curriculum by the educating and curriculum system itself to deal with the new emergence.

So the question is how to work out reasonable and exercisable curriculum, then incorporate it into educating and curriculum system, or, to adjust the system so as to absorb the new emergence.

### 2.3 Problems encountered in fast responding to crew-manning market

For countries interested in crew-manning supply, their MET institutions should have good capability to respond various needs from the manning market. The needs and their changes from the manning market mainly are: 1) high quality seafarers. Those who master in both navigation and sea transportation management may bring more safety and profits to shipowners. 2) seafarers with designated quality. 3) the number of seafarers available 4) the quality, knowledge and skills of seafarers available 5) time for obtaining available seafarers, etc.,

The demands from the manning market can be variable, and may impose upon the MET institutions abruptly. Possibly one day a large shipowner or crew-manning agency drops in unexpectedly, listing out various requirements for his prospective employees (seafarers). Again, when the oil tanker market booms, the market may require enough competent seafarers to be supplied in short period. Thus for institutions, first of all they

should have a fast-responding scheme in place, and then have good capability of response making. However, this is exactly what many MET institutions are short of, since most of them work according to pre-planned schedule and rigid curriculum. Even though there is a modification for that schedule and curriculum, it takes time. MET institutions therefore stay in a passive position. That is the question.

### 3. Measures for problem solving

#### 3.1 Measures to be taken for problems in section 2.1

There are two alternatives: 1) cutting away or compress the content of theoretical education, making it simple. 2) enhancing the efficiency of education and training.

There might be some difficulties when putting the first method into practice. How much importance should MET place on theoretical knowledge is always in discussion. Additionally, maritime instructors complain about the reduction of theoretical teaching hours.

So the necessity of seeking for advanced and high efficient methods does exist. The second consideration is much preferable, and can be achieved currently in the following ways: 1) the use of multimedia education and training facilities 2) the use of CBT software 3) the use of simulators. Particularly the CBT, which enjoys concurrently the advantages of cost-effectiveness and efficiency, is able to solve the problem of funding and the expanding of education and training hour as well.

#### 3.2 Measures to be taken for problems in section 2.2

To fast respond to the emergence of new subjects and training items,

- 1) adoption of concise and quick curriculum designing procedure

This is purposed to shorten the time spent in the first stage (see Figure 2-2). By comparing with other types of curriculum designing models, the procedure enjoys the advantages: "... Given the pressures that teachers and curriculum developers work under, a rational model provides a straightforward, time-efficient approach to meeting the curriculum task." (Murray Print, 1993). The procedure is shown as follows (Figure 3-1).

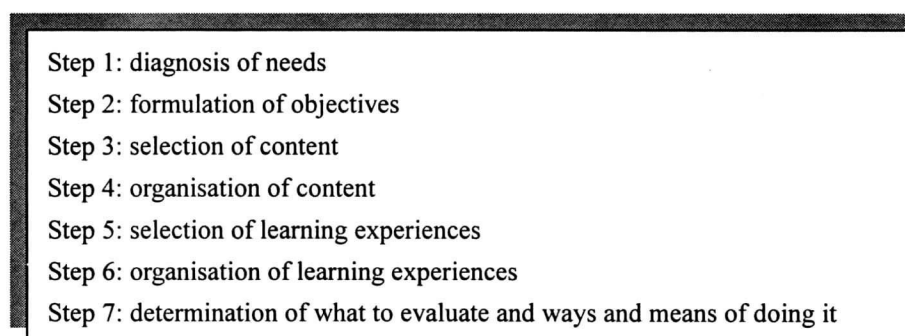


Figure 3-1

Source: After Taba, 1962

- 2) adoption of Project Management (PM)

Project management is proved to be a powerful tool. "Project Management is a way of fulfilling different tasks within a prescribed time period, the budget and quality objectives by combining various systems, methods and human resources. An efficient PM means planning, distributing and controlling for all

organizational resources in a time period prescribed for the realization of substantial indexes and objectives.” (U.S Project Management Institution, *Guidance to Project Management*)

The use of project management in a new emergence introduction possesses the following advantages:

- a) enhancing by and large the capability of adjustment for an educating system towards the emergence of new subjects or training items
- b) harmonizing the cooperation between departments and sections, and utilizing efficiently human resources, funding and other resources
- c) improving the quality of subject to be introduced, etc.,

3) flexible styles for course delivery

When failed to introduce new subject into educating and curriculum system, those styles can be applied:

- a) short courses. b) symposium. c) intensive training. d) others

### 3.3 Measures to be taken for problems in section 2.3

A scheme of fast response making should be established first of all. Section 3.2 covers that. Then the capability of response making should be built up.

A designing of dynamic and flexible education system should be considered, where fixed and flexible modules co-exist to a reasonable proportion. Those modules can be organized in different ways in order to suit different needs. Meanwhile, in such a system, the whole hours should be divided fixed and flexible hours to a certain proportion. The figure 3-2 tells the basic idea of such a system.

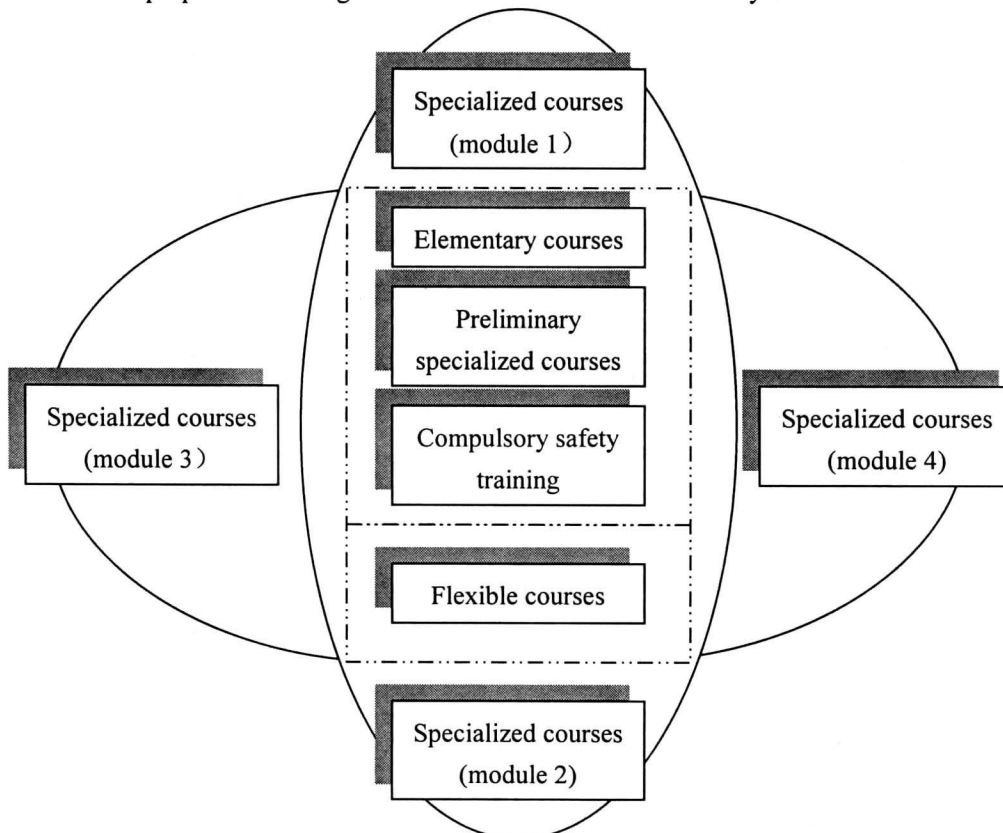


Figure 3-2

#### 4. Summarization

MET evolves fast. Challenges and opportunities co-exist. The above is only a part of discussion and analysis. For a better solution, and also for the purpose of meeting fully the changes and development of MET, it should be pointed out that the following should be applied comprehensively.

- 1) The latest teaching pedagogic and training tools, including the application of computer technology
- 2) The application of various management sciences, such as information management, project management, and human resource management.
- 3) The application of systematic engineering science
- 4) The comprehensive application of the miscellaneous methods

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