

# Needs and Importance of Master Studies for Navigators in XXI Century and Connectivity to STCW 78/95

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**ABSTRACT:** The high-level technology and equipment of modern ships from one side and the constant growth of high stress and psychological pressure to ship officers, especially on management level, from other side pose a number of important questions relating to optimal combination of professional knowledge and skills and personal characteristics of seafarers. What may be the best combination of different subjects and courses in training programmes? What may be the role and place of master studies in evolving of high qualified specialists from one side and strong and self-confident personality from other side? What should be the most important difference of master study programmes for ship officers from those for land-based personal? The author of this presentation tries to discuss these questions relying to his long-time experience in field of maritime education and training and in organisation and carrying out of master studies in maritime academy.

## 1 HYPOTHESIZING OF PROBLEM

Taking under investigation the main problems and bottlenecks in field of providing of navigation safety during last 20-30 years, we may detect the paradox situation: the rate of accidents at sea doesn't show a tendency for decreasing, so that annual ratio module of ships totally lost related to number of ships in whole world merchant fleet is today more or less the same as 20-30 years ago. By first look, it seems to be at least strange because the technical and technological level of nowadays ships is much higher than some decades ago. The devices, appliances and apparatus that complete the modern ship bridge and engine rooms are in general relatively easy-going in exploitation and user-friendly. The professional preparation of seafarers is regulated by world-wide acknowledged international regulations, first at all by STCW 1978 Convention. The majority of maritime schools and academies have consistently been evaluated by competent authorities and their programmes and courses are recognized as meeting the requirements. But why we have no today the significant improving in statistics of marine accidents in

whole or, at least, speed and scope of dynamic of their decrease don't satisfy us?

Author of present paper has disserted subject in question more than once, for example by presentation on the 13<sup>th</sup> International Conference on Maritime Education and Training IMLA 13 "Safety at Sea through Quality Assurance in MET Institutions. Quality Assurance in Action". In paper presented on conference author tried to carry through some initial analyses and to bring forward the point of view that the main factors bringing on the high accident rate at sea are not the technical once but rather lay in sphere of human nature and personality (Alop, 2004).

Some developments during period from 2004 up to date affected author's positions and viewpoints on matters under discussion. First of such developments is "The Manila amendments to the STCW Convention and Code" adopted at a Diplomatic Conference in Manila, the Philippines in June 2010 and set to enter into force on 1 January 2012 ([www.imo.org](http://www.imo.org)). According to amendments there will be changes to each chapter of Convention and Code, among these new requirements for marine environment awareness training and training in leadership and teamwork.

This fact shows growth of understanding of decision-makers on the highest level that promotion of technical knowledge and skills of seafarers is not enough for breakthrough in problem of improving of marine safety but so-called “soft values” will play significant or may be even crucial role in achieving of that. But, at the same time, the author’s numerous discussions with seafarers and instructors in MET institutions allow supposing that it’s not very clear what kind of teaching and training methods as well as teaching materials might provide the effective results in training of leadership and teamwork of seafarers. And how to measure and evaluate properly results of that?

Secondly, the curriculum for master studies with speciality for navigators has worked out and launched since 2006 in Estonian Maritime Academy (EMA). Author of this paper was directly involved in process of development and improving of this curriculum during all the last 5 years and is the Head of Master Studies in EMA at the present time. The experience and knowledge in field accumulated during this period afford him to make a presumption that master studies are very suitable stage of training for development of personal characteristics of seafarers. How and by what schemes of organization of training it is achievable in the best way is the question for what author tries to find some answers hereafter.

## 2 THE ANALYSES OF TRAINING SCHEMES

### 2.1 *Training triad today*

It’s clear that ship officers, first at all navigators are the key persons in providing of safety on board. High level and good quality of their professional knowledge and skills, good seafaring experience and great personality play a crucial role in achieving of high level safety of vessel, people and environment at sea.

Let’s examine this triad [ i) knowledge and skills, ii) experience and iii) personality] from assimilation and trainability point of view. Obtaining of all the necessary for seafarers professional knowledge and skills is more or less wholly the result of well organized training (incl. training on board), simulation and assessment processes. The STCW 78/95 Convention gives by its Code enough good and effective instruments for achieving of professional training goals erected. The personal characteristics of students have importance on this stage only as assisting means making training process easier or, in opposite, more difficult for each person. More sluggish brain just need more time for understanding and adopting of lessons; indecision and undiscerning have not

crucial importance for passing of occupational tests and exams although may lead to poorer grade.

Speaking about seagoing experience it’s clear that experience may not be obtained faster by some accelerated training lessons. The figure of speech “to share experience” seems to be a little wrong and actually is misleading because experience is not professional knowledge that really may be shared. Experience is extremely personal and very valuable exclusive kind of knowledge and skills that may be obtained only by going through real life situations. In this case the personal characteristics play much more important role and they determine what the “life lessons” will be given to actor and how useful this lessons will be for him in possible substandard situations in future. Question is: how is it possible to obtain an experience of optimal acting in critical situations by training? Whether is it possible at all?

Third “pillar” personality is not something spontaneous but it is tightly connected to all processes incl. training and especially working life. As was showed above, the personal characteristics such as discretion and decision-making ability, self-determined intellectual power, presence of mind and courage to take upon responsibility or to hand it out to other persons are not really important in process of traditional professional training, carried out in big part applying the “teaching methods” “do like me” or “do according to instructions”. Unfortunately, this approach is favoured up to present day by the STCW 1978 Convention and its Code. Adoption of “The Manila amendments to the STCW Convention and Code” gives us the hope for changing these attitudes in the near future.

The personal characteristics are much more important in process of obtaining of seagoing experience. What higher position in ship hierarchy than more important to have the good certain personal characteristics. For officer in charge of a navigation watch the ability for good teamwork is the most important, for chief mate and especially for captain it is important to be a leader and to have ability to manage and direct the people. Actually, all these qualities and mutual relationships manifest themselves mainly during job life on board. Trainees on board may keep an eye on these developments but they may not be real actors in them.

Having of great personal characteristic like listed above or lack of them gains the crucial importance in critical situations. In fact, a lot of human lives and huge material values may be saved or lost depending of them. Are the great personalities always inborn or they may be partly or even in whole obtained? Is it possible to acquire them only by method of “experiments and errors” in real life or there are some methods for training them?

It is complicated to give some definite and complete answers to these questions. The STCW Code foresees two courses what are intended to certain extent for development of personal characteristics. First is Bridge Resource Management course (BRM), this is also called Bridge Teamwork Management. Normally it is a three day course of instruction. Second one is Crowd and Crisis Management (CCM) and it may be one to four days long depending on training organization.

Unfortunately, in author opinion, these courses giving in usual learning environment of maritime schools and academies can't solve to needful extent problem of training out the students' personality and obtaining of essential personal characteristic in process of curriculum studies, i.e. in maritime schools and academies. The students don't have some significant sea-going experience or their experience is limited to trainee's seagoing training on-board. Above-mentioned courses, as rule, are theoretical for them and come by well known method "do like me" or even "think like me".

## 2.2 The Bologna process implementation

The aforesaid is related to so-called one-step training system for deck officers, being in use in EMA during last two decades. EMA as educational institution may be identified as so-called Professional Higher Education Institution (according to Estonian education system) or as the University of Applied Sciences. Students of navigation faculty obtain theoretical knowledge and skills according to STCW 1978 requirements for both operational and management level during four years and they have additionally one year sea-going training on-board what officially is not included into duration of curriculum. These studies allow obtaining the qualification of officer in charge of a navigation watch after graduating on bachelor level. Formally, for achieving of captain position the graduates don't need coming back to school for additional training (of course, except the obligatory refreshing courses envisaged by STCW). It is only the matter of their seagoing career and practical experience. But, in author opinion, they, having good professional knowledge and skills at the end of their studies in school, have not enough good preparation in field of teamwork, leadership, team management, acting in substandard and critical situations and so on.

In year 2006 the 1,5 year long curriculum of master studies was worked out and implemented in EMA. The name of curriculum is Maritime Studies and one of three specialisations is Ship Maintenance and Navigation (SMN). In fact, this is a joint curriculum of EMA and Tallinn University of Technology (TUT) and it is oriented to giving to students wider knowledge in so-called academic subjects (subjects

of TUT) as well as in professional subjects on higher than bachelor level (EMA subjects).

List of main EMA and TUT subjects see Table 1.

Regarding to Bologna system this is 4+1.5 (330 ECTS) long higher education studies for obtaining of master degree (one year of sea-going on-board training on bachelor level is not accountable for academic duration of curriculum).

All the students of master studies in EMA are working people. This is why a big part of learning is a distance learning and contact hours take place in the evening time. The most part of SMN speciality students are active seafarers (both navigators and engineers). Despite to that the curriculum is highly popular amongst graduates of EMA.

Table 1. Some subjects of master studies programme Maritime Studies

Subjects of EMA	Subjects of TUT
1 Research methodology	1 Foreign language for science and research
2 International public maritime law	2 Financial management
3 Risk management in shipping	3 Introduction to information systems
4 Hydrodynamics and seagoing characteristics of vessels	4 Investment analysis
5 Optimization of navigation	5 Quality and productivity management
6 Shipping company management	6 Project management
7 Safety and security management in shipping	
8 Merchant shipping law	
9 Ship chartering and agency	
10 Organizing of work and shipping economics	
11 Environmental pollution prevention and pollution control	
12 Automated control systems of ship	
13 Ship design and architecture	
14 Navigation safety control systems	

Looking at list of subjects in Table 1 one can see that students whether deepen and expand their occupational knowledge (EMA subjects 3, 4, 5, 8, 12, 13, 14) or prepare for themselves "springboard" for jump into future onshore working life (EMA subjects 1, 2, 6, 7, 9, 10 and all the TUT subjects). Taking into account the fact that for majority of them the main part of their seagoing career still ahead, it seems to be reasonable to bring to studies more subjects and courses that may assist them in developing of not only occupational competence but also the personal qualities essential for solving of complicated situations arising in management and administration of ship or in critical situations. The question is not only what courses and subjects should they be but also how to build them up and conduct them in such way and by such methods that result will be the most productive and efficiency?

### 3 THE COMPLEXITY APPROACH

#### 3.1 *Tests for entrants*

First at all it seems to be essential to carry out the psychological test for youngsters wishing to entrance to maritime schools for navigation studies. Although the number of personal characteristics may be developed during studies and working life period, there are some of them what may be only congenital. The duty of such psychological test would be to check out persons who are improper for seagoing career by reason of their personality. In this case we have to deal with so to say total career-unfitness.

The ratio module of such cases that may be revealed on the very early stage with high extent of certitude is definitely not big, probably less or even more less than 1%, but it seems to be very important to detect such youngsters before entrance to school because in course of professional studies an exposure of such problems is not real. There are known the cases when students were enough successful in their theoretical studies and hadn't any problems before going to first long-time seagoing on-board training. But after some weeks on board of vessel they had a serious depression and other psychological problems and were evacuated from ship before end of practice and had to say good-bye to seagoing career at all.

#### 3.2 *“Sandwich” type studies?*

From point of view of development and assurance of personality of seafarers the two-step or so-called “sandwich” training system for navigators seems to be more appropriate and effective than one-step or continuous system.

This last mentioned system is applied now in majority of MET institutions and it has undoubtedly a lot of advantages. For instance, training institutions may build up the learning process in the most optimal way economically and methodically giving continuously students the professional knowledge and skills (at least theoretical part) on both operational and management level (Pöldma, 2010). Problems with bringing people back to school for management level studies are not to take place as well as seafarers problems with taking up such studies. However, students having some seagoing experience by on-board training during studies have no to good an extent experience in management and administrative job on board as well as in human relationship and teamwork. It seems to be quite ineffective to teach theoretically leadership to people who didn't have any possibility to try to be leader in real situations.

In author opinion, the “sandwich” system seems to be more effective for achieving of good results in leadership and teamwork as well as in development

of personal characteristic that essential for successful acting as team leader and strong person.

Taking as example the training system of the EMA it may look as following. Period of training on bachelor level should be shortened up to three years (180 ECTS) of theoretical studies plus one year of seagoing practice and this will cover only training for operational level. Professional output will be as before the officer in charge of a navigation watch having the bachelor academic degree. Studies can be made one year shorter thinking to transfer of some management level subjects and courses to master studies stage and to reducing of capacity of so-called academic subjects to minimum (the criterion is that graduates obtain the academic grade as bachelor according to provisions of education system). The stress of first stage studies should be placed on good professional preparation.

The second stage of studies will be the master studies with two years duration. The master studies will contain some high level professional training needed for essential competence on management level and a lot of academic subjects. It's necessary to work out and implement to curriculum the block of “personality studies” that will allow developing properly personality of future captains and chief mates. But this block shouldn't consist of theoretical subjects only and teaching tools and methods applying for these studies should be something different taking into account specificity of audience.

#### 3.3 *Teaching methods and tools*

The most advantage of students' audience on stage of master studies from point of view of psychological and personality training is their seagoing experience. This includes undoubtedly to less or more extent experience in ship management and administration and, of course, good teamwork experience. It's very probably that some of students got together with their ship into more or less difficult or even critical situations, so they have such kind of experience as well.

Because students will have very different job positions on their ships and very different seagoing experience, it will possible to apply for “personality studies” some teaching methods what are the most suitable for specific audience of experienced seafarers.

Author of this paper have had lucky to take in period of 2004-2008 part in projects “Securitas Mare” and “Securitas Mare II”, main task of which was working out and implementation of CCM course for seafarers on European level ([www.tg4transparency.com](http://www.tg4transparency.com)). Such 3.5 days long course was successfully worked out, tested by number of trial courses in different European countries

and got a full approval from DNV. In author opinion, the most important and valuable result of these projects was the successful approbation of the advanced teaching and learning methods used in trial and demo courses. As the main goal of CCM course is to learn how the people crowd may be restrained in critical situations, this course is very strongly about personality and personal characteristics of seafarers, especially on top-management level as well as deal with psychological problems, leadership, and teamwork and so on. So, all the know-how and experience obtained during running of these projects are very suitable for applying in abovementioned block of “personality studies”.

Let's name these methods what, in author opinion, may be successfully used in organisation of “personality studies” for active seafarers.

Firstly, this is so-called “dual-instructor” method. The core of this method is that the course is carried out from beginning to end by two instructors, who work in tandem and run course in regime of dialog with students and one with another. They have to have a different background and very good experience (to be experts in field). In our case one has to be well experienced captain and other high-level psychologist. The professionalism of such persons as teachers, and their personality and ability to work together has a crucial importance for success of studies.

Secondly, it's reasonable to take in use experience based learning (EBL) method. This method based mainly on skilful using by instructors the cases bringing by students and their experience. In fact, the students enhance each another by presentation and discussion of situations they had in their seagoing career so far. The main task of instructors is to mould these discussions and to solve didactic problems by comments from different points of view and making of conclusions. Effective using of this method is possible only if audience consists of persons who have more or less experience in field of studies. As it was shown above students of master studies will have as rule to certain extent such experience, so EBL method should be suitable for “personality studies”.

Thirdly, the method of learning by doing (LBD) shall be used maximally. Lectures are not typical for such type of studies; the main learning tools are discussions, practical exercises, group works. As in abovementioned CCM course, the very importance instrument for achieving of course goals is a practical drill on board of real vessel, in course of what the students will get into complicated and unexpected situations and will be obliged to find optimal solutions.

Courses carried out in such way must have the maximum effect for development and training of essential personal characteristics of seafarers. Furthermore, this block of “personality studies” may be offered successfully not only for students of master studies but be one of refreshing courses for active seafarers in whole.

By author experience, the crucial factor for success of such “personality studies” is the quality of abovementioned tandem of instructors. Their professional and personal background is so different that the creation of such high professional level tandems is not very easy. There may be some other problems with approving and financing of such schemes by authorities of maritime schools, so it may be reasonable for MET institutions to find some common solutions.

## CONCLUSIONS

The personality of seafarers is not less important than professional knowledge and skills. Moreover, in critical situations the personal characteristics of captain and/or other decision-makers on-board may become even more important taking into account the crucial importance of right and effective acting for saving of human lives and material values.

The using of traditional teaching and training methods may supposed to be enough good for achieving of professional training goals. As according to “The Manila amendments to the STCW Convention and Code” these methods are at least insufficient and shall be overestimated and more effective and non-traditional methods should be found out.

It is necessary to discuss and find out the appropriate answers for important question: how to build up the system of MET for seafarers providing the achieving of the most effective results not only in professional preparation and training but in development of the great personality as well.

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