

Competence Based Learning and Evaluation: Developments and Non-Developments in MET

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Introduction.

The status of MET around the world is of a different standard and level of sophistication. Despite the STCW95 review which was supposed to create a global standard framework for a.o. education and training, the exercise and subsequent document has been so politically influenced that there are many ways of interpretation possible.

Hence one might pose the question what is still missing in the MET initiatives and processes and what can be done about it. GlobalMET has taken the initiative to try and set the questions and give some guidance towards the answers.

In order to show how a qualitative system can be developed it seems interesting to view the MET evolution in a major seagoing country such as the Netherlands. Over the past years a great number of changes have taken place in MET in the Netherlands. The changes have been industry driven, educationally driven and politically driven. The various programmes and systems and the respective qualifications awarded are of interest from about 1970 until present. One significant development milestone has been the introduction of the dual purpose programme in MET. This started a phase of different philosophy compared to the MET systems in many other countries.

Subsequently the introduction of STCW 95 will have introduced considerable changes in the training methodologies worldwide as well. Besides that, new developments in education in general are often also applicable to global MET and the intent will often be to implement these changes in line with other programmes within educational systems. A number of these additional recent developments have been identified and are also explained hereafter.

From 1970 onwards.

The shipping industry is often characterized as being very traditional and conservative. However even the strongest of critics must view the MET in The Netherlands with admiration. From 1967 until now some 7 forms of MET structures have been implemented.

- AS/ BS a 2 year sandwich system where the theory for 3rd mate and 3rd engineer was included. Oral exams and higher rank studies were to be taken in sequence later.
- BS/BM a 2 year sandwich system where the theory up to 1st mate and 1st engineer was taught and oral exams done by the Ministry of Transport.
- HTS-N/HTS-W being the 4 year front ended Dutch equivalent of the Bachelor programme with all theory up to 1st officer and 1st engineer including 1 year seetime.
- HTS-Nplus/HTS-Wplus: an extension of the previous system, however now with an optional component of the lowest level CoC of the counter discipline
- Marof HBO (semi-integrated Nw of Wn) is the mandatory follow up of the previous system whereby both operational level CoC's were awarded and the highest in the counter discipline acquired after sufficient sea service
- Marof HBO (fully integrated officer) being the fully integrated dual purpose system whereby the highest rank in both disciplines is achieved,

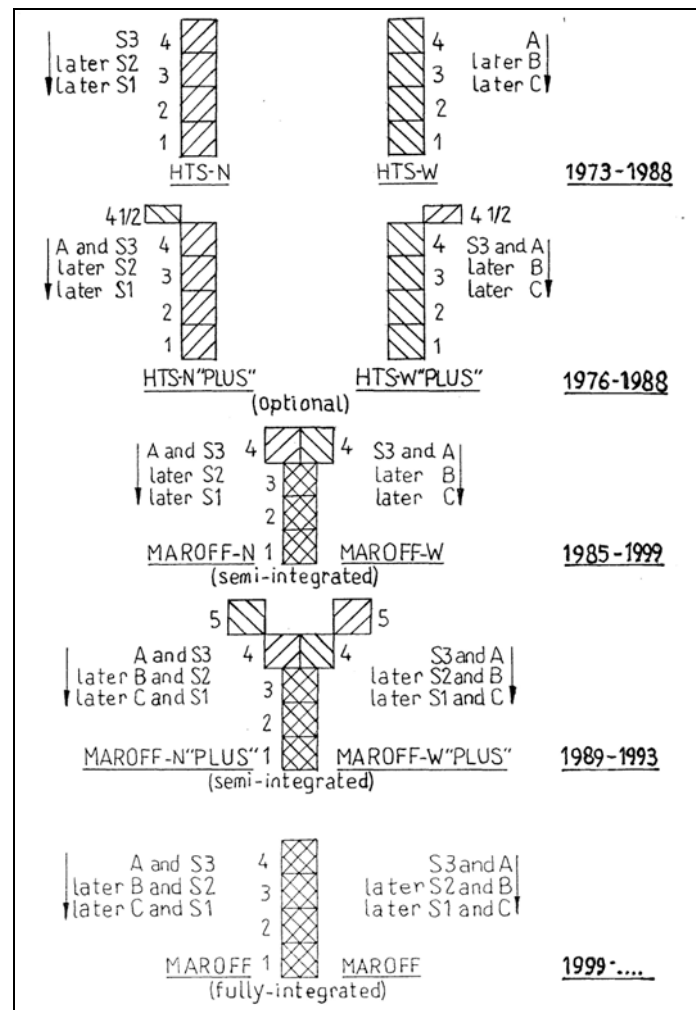
- Marof BMO (Bachelor of Maritime Operations) in which the demand for specialization in the final year is heard again from industry as the ships still require specialists rather than only generalists to perform efficient operations.

The above illustrates a new system every 5 years which in turn means that one cycle of the predominantly 4 year programmes which are delivered can barely be run once, before the next amendments are already being introduced.

The Dual Purpose switch.

The system of dual purpose or integrated training of seagoing personnel has been around for quite some years now. As the level, extent, rewards and terminology used in this context vary considerably the phenomena tends to be often misunderstood by those not directly involved. An attempt is made to explain the various systems used in dual purpose training and operations in The Netherlands.

The basic idea behind the introduction of the polyvalent or dual purpose merchant officer is that in essence the running of a vessel is a single operation viz. carrying out the shipborne transport of merchandise in a safe and economic way. The objectives of all officers and personnel on board converge in the achievement of this set goal. The advance of modern technology on board ships, reflected in increasing automation and mechanisation makes the concept of the dual purpose officer perfectly feasible.



Netherlands dual purpose evolution

One issue is essential to remember when discussing and designing the dual purpose curricula and about which some misunderstanding and controversy still exists: The dual-

purpose training programme shall always take into consideration that the majority of the shipowners still have mono-disciplined shipboard operations. This implies that the graduates will have to be able to function in both a mono-disciplined as well as a dual-purpose environment. Functioning in a mono-disciplined environment will be possible in the same professional manner as would be in a dual purpose operation.

Competences required.

Apart from the structure evolution of both shipboard operations and the related training and education systems as illustrated above, the content of the various programmes, the development of curricula and the philosophy of teaching, was also changing at the same time. Obviously these activities further complicate the implementation of the teaching efforts.

- The shift from subjects to modules to competences

First of all the traditional subjects were grouped into modules which have some or other kind of coherence. These modules in turn were then clustered into competences. Obviously here the structure of the STCW 95 revision should have triggered this evolution in each MET system globally

- Knowledge based versus competence based learning

The other trigger within STCW95 was supposed to be the change from knowledge based learning and evaluation to competence based learning and evaluation.

Numerous educational books and theories describe the features of competence based learning. Although there are slight differences by philosophy or culture all systems do agree on the basics.

What competence based learning definitely is not, is the continuation of the traditional classroom theory teaching, describing the competence required verbally or written and then hoping that students will be able to transfer that knowledge of the process, skill or competence into the actual action when on board ship. And this of course both in routine and emergency situations.

Competence based learning will acquire a different approach, less class room theory and a lot of hands on workshop, laboratory, training vessel or simulator practice and assessment.

- The change in examination regimes

With reference to the above it will become obvious that the endless written exams are only to a limited extent suitable for application in competence based education and training. The competence of being able to write is then the main element being assessed.

And even the ever popular oral examinations are really only assessing if someone can speak understandably (also a great competence) but hardly what we are expecting as the prime task of for instance a competent ship handler.

Examinations or assessment of the skills and competences without the proper tools to demonstrate one's competence with, can not classify as competence based evaluation.

In Netherlands a decrease in the number of written exams to about 50% of the present amount is taking place and continuous assessment, portfolio and practical demonstrations are the methods used in the new style examinations.

Competence based learning

Another new element STCW95 brought us is the identification of learning objectives required to be met for various ranks, functions and subjects. Standards of competence are by definition related to functions. The functional approach will now allow for competences be developed which can form a common basis for the certification of seafarers.

In a competence based training system the basis of the training design is explicit and has measurable standards of performance. This implies that assessment will form an essential part in a competence based system. This in turn will require a high degree of QA to take place in order to check that the training and assessment are performed in a proper way.

When setting up such a system a number of steps are to be taken:

- standards of performance are to be distinguished
- identify the relevant competence based standards

- check these with the already applied practice
- where there are differences there is an apparent need for training

The competence based standards then form the framework for assessment. Evidence of performance will be monitored and measured, possibly by means of “before and after” testing. Accreditation that all of the efforts are resulting in the right outcome is the final step.

Competence based evaluation.

Demonstrating one’s competence can be done in a number of ways and in the maritime field by a.o. approved simulator training where appropriate. As such simulators seem a useful, relevant and widely applied training tool so evaluation and assessment should also be possible through this type of tool.

However how this shall be achieved as well as what type of simulator is required to achieve demonstrating a certain competence are questions which will easily come to mind.

The classification of simulators drafted by IMSF and others and adapted by DNV in their standards seems relevant and useful in relation to applications and the relevant learning objectives.

Once the simulator training has been approved and the right type of system is used for such then the even more complicated and interesting issue of assessment and examination of the evidence from this training comes up. This should obviously show if a person is able to perform a skill and thus be judged competent.

If assessment seems difficult in general teaching, imagine how it will be in a specialistic field as the maritime operations are. New techniques and methods for an objective assessment seem crucial.

On the issue of assessment of training and skills competency a number of points:

- training without assessment is a wasted effort,
- focus on methods for assessing competence,
- testing in life like situations,
- simulators provide training resembling shipboard practice,
- use training tool (simulator) for assessment of competence,
- criterion referenced testing will be required,
- other methods which can also be used for evaluation of competency are: training vessel, practical workshop, continuous assessment, written exams.

This means that in a competency based training system once the competence or function has been described, a check must be made, the assessment, if the competence is mastered. This check will have to be done against predefined criteria. These can be agreed upon in advance so that the trainee is informed of what he will be assessed on and against which criteria. In order to attempt to show the complexity of changes and developments in the structures and the contents it seems useful to incorporate these elements in a matrix as is shown hereafter.

Other phenomena and developments.

- The Major/Minor structure and the Bachelor/Master structure

From the Europe wide education harmonization discussions a number of new items have emerged. The Major/Minor structure is a system whereby the core of an educational programme is considered the major and this can be complemented with a number of minors often offered as electives. In this way a diversification is possible within the structure of a school system and it almost allows for tailor making the programme to the preference of student and sector of industry.

The Bachelor/Master structure aims at formatting higher education programmes Bachelor level structures in order to clear the way towards Master programmes in continuing education.

Netherlands MET	Sandwich system	Front-ended	Duration	Subjects	Modules	Competences	Knowledge based	Competence based	Examinations	Assessment	Major/ minor	BA/ Ma	Diploma	Degree	ECTS	QA
AS/AM Ended 1967	x		2	x			x		x				x			
BS/BM Ended 1973	x		2	x			x		x				x			
HTS-N / HTS-W 1973		X	4		x		x		x					X		
HTS-N plus / HTS-W plus 1976		X	5		x		x		x					X		
Maroff HBO (semi) 1985		X	4		x		x	x		x				X		x
Maroff HBO (fully) 1999		X	4			x		x		x		x		X	x	x
Marof HBO (specialized) 2004		X	4			x		x		x	x	x		X	x	x

Netherlands MET composition

- The change from diploma's to degree's with introduction of Dublin descriptors

The seafaring education programmes were traditionally only developed to provide the graduates with certificates of competence for the various ranks. Both seafarers and industry are now starting to realize that there might be another life than seafaring and further studies will be important. By incorporating the seafaring educational programmes into already existing academic structures within training establishments the graduate seafarer should be able to at least acquire a Bachelor degree. The next step can then ever be Master studies or even PhD research.

Within the Bachelor degree a number of general competences apart from those required by the profession must be developed and incorporated. These are the so-called bachelor competences laid down in the Dublin descriptors

- The European Credit Transfer System initiated in the Bologna declaration.

If harmonization is to have any success at all, there must be a common method of awarding study results. For this purpose the European Credit Transfer System was developed and has now been introduced in most higher educational programmes in the Netherlands. Each year of study contains 60 EC and thus the MET bachelor programmes are totaled to 240 EC.

- Quality Assurance in MET through STCW95 guidelines.

With the advent of the revised STCW code new aspects are being introduced in the traditional maritime education and training concepts. One of these aspects is the matter of quality standards in maritime education and training with consequently the related quality control and quality assurance requirements.

In the manufacturing industry these are well adapted requirements for which a number of systems and standards have been developed and applied. In the services industry, and as such education and training should be regarded, there are also possibilities to apply various qa systems. However in maritime educational systems this is fairly novel.

What is wrong?

The above paragraphs attempt to illustrate activities which have been initiated in the seafaring training industry of an established maritime nation. However as pointed out there are huge differences worldwide on the level and sophistication of MET. Below are six major issues and proposed actions to address each, as agreed at a previous AMETIAP/Global MET seminar and since endorsed in subsequent discussions:

1 STCW has not achieved a universal standard, there is too much non-compliance (some willful), too much room for interpretation and competence not validly assessed:

Proposed actions:

- compliance enforcement to be enhanced
- competence beyond compliance to be sought
- clear definitions of 'STCW competencies' to be spelt out
- international goal-based criteria to be developed
- review and amendment of STCW to be initiated, with MET providers having significant input;

2 the industry does not have a strong commitment to training, which is seriously under resourced and with insufficient recognition given to the investment aspect of training:

Proposed actions:

- the value of training to be identified and promoted;
- a structured demonstration of how training pays to be developed
- cost/benefit ratios to be determined;

3 there is a shortage of competence in the delivery of MET, the professionalism, expertise and industry experience of trainers needs strengthening:

Proposed actions:

- minimum standards for the delivery of maritime education and training to be developed and implemented
- more recognition that assessment is the driver;

4 there is little commitment to continuing competence:

Proposed actions:

- requirements for mandatory verification of continuing competence to be developed
- advocacy for continuing professional development to be strengthened;

5 attention has been too concentrated on technical aspects:

Proposed action:

- the focus on holistic and 'soft skills' to be increased – leadership, communication, intercultural relationships, motivation, attitude.

6 insufficient attention is given to recruitment and retention of seagoing staff and to ensuring appropriate educational background, attitude and aptitude:

Proposed actions

- selection of recruits to be improved;
- retention difficulties outlined by recent research and 'lack of career' perception to be addressed.

The last item 6 - recruitment and retention - reflects the overlap into other human resource issues. Again, the real question is how this may be achieved? Suggested basic principles to consider are:

- industry to be the driver of change in this respect;

- proposals for change to reflect the various sectors of the global industry - in fact all activities that will benefit from improved MET;
- the seafarers and the MET providers to have input which reflects their crucial industry roles. It is the industry that must pick up the ball. It is the industry that must put its house in order with respect to the serious human resource issues - and we are part of that great global industry of fundamental importance to the global economy.

With input from a much broader base, thinking will be clarified and clear recommendations formulated. The close collaboration between all sectors of the shipping industry – ship owners, ship managers, manning agents, regulators, suppliers, educators and trainers – should also extend to relevant sectors of other industries with similar education and training needs; eg other sectors of the transport industry.

Raising awareness of what is wrong and what to do about it appears an appropriate initial step. To do this a clear statement needs to be formulated, distributed and accepted. This statement should be prepared by a small group, distributed and accepted by the industry as a statement of policy for the development of the education and training it needs into the foreseeable future. Steps to implement that policy should then be determined.

Conclusions.

Many training establishments offering maritime programmes are involved in multiple dynamic activities. Programmes are changed due to demands from industry, structures of contents are being changed due to educational harmonization and new insights, conditions under which to perform and the related financing are under pressure and being changed due to political priorities being adapted. At the same time the interest for a seafaring career in the western oriented countries, including Netherlands is decreasing with the present young generations. Less seafarers means less mouth to mouth advertising which results in less students knowing of the profession and the opportunities.

Obviously thus, an enormous amount of effort is being put into pr activities, advertising and heralding the beauty of the sea, the good employment conditions and the abundant opportunities in both seagoing and shorebased maritime employment positions. However having succeeded in attracting sufficient numbers of (prospective) seafarers will only have the required results if the next pitfall can be avoided: the lack of well trained and qualified teaching staff. Educational programmes for MET lectures are under development and will soon become available.

In order to address the need to further develop maritime education and training:

Stage 1

1. a statement as to maritime education and training problems and solutions to be prepared by the MET providers, in association with seafarers and other sectors of the shipping industry and other interested parties;
2. this statement to be widely reviewed within the industry and amended accordingly;
3. industry to agree the statement reflects its needs and actions needed to meet the needs;
4. the statement to then be distributed to associated bodies, such as IMO, ILO;
5. overall agreement on a 'voyage plan' for improving maritime education and training

Stage 2

1. implementation methodology, resources needed and accessible to be determined by an industry representative group;
2. plan for implementation to be prepared, distributed and agreed within industry.
3. implementation to commence, with subsequent review and adjustment

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Brief CV of Author

After an operational seagoing career in the Dutch merchant and offshore construction fleets, Capt. Cross became a qualified lecturer in higher nautical education in the Netherlands. Simulator instructor, examiner of masters and mates, lecturer of maritime education and training at the World Maritime University were the next occupational stages. Then Capt. Cross was employed as Senior Advisor at then Kongsberg Norcontrol Simulation and highly engaged in research projects, functional development of maritime simulator systems as well as simulator instructor and assessor training on a worldwide basis. On 1/1/99 he joined the Maritime Institute Willem Barentsz on Terschelling in the Netherlands in the position of Director. Professional memberships include a.o. Nautical Institute, Royal Institute of Navigation, Netherlands Society of Maritime Technologists, Netherlands Association of Master Mariners, IMLA, IAMU, IMSF, AMETIAP/Global MET.

ANNEX 1: Global MET.

GlobalMET/AMETIAP CHARTER 2006 - 2010

We, the representatives of the Member Institutions of the Association of Maritime Education and Training Institutions in Asia Pacific, participating in the 2005 Annual General Meeting of AMETIAP (Global) Limited in Manila, Philippines, in November 2005:

Recognising that AMETIAP was formed to promote, develop and support, in the spirit of co-operation, the common interests of its members in all matters concerning the development and quality of maritime education and training institutions, with the declared objectives:

- to provide a forum for the exchange of views among members;
- to foster, develop and maintain close cooperation between and among members on matters relating to maritime education and training including maritime research and development and other matters of mutual and/or collective interest;
- to extend assistance consistent with its policies and capabilities to any member upon the latter's request;
- to formulate a common stand on issues of interest to AMETIAP related to maritime education, training, research and development;
- to improve or assist in improving the services provided by members through the efficient and economic utilisation of resources;
- to represent the general membership in its collective dealings with regional and international organisations;
- to acquire, collate, process and disseminate relevant data and material of common interest to all members;

Agree that, during the period 2006 to 2010, in working to achieve its objectives AMETIAP is to collaborate with the International Maritime Organization, International Labour Organization, International Shipping Federation, Asian Shipowners' Forum, International Transport Workers' Federation and other appropriate international, regional and national organisations with the further development of quality maritime education and training by:

- entering into agreements for mutually beneficial collaborative activities;
- liaising with parties interested in the provision of quality maritime education and training;
- serving as a communications network, source of information and channel for advice for members, as well as for non-members;
- representing member institutions as appropriate;
- promoting effective maritime education and training as fundamental to safety, efficiency and security in maritime transport and to the protection of the marine environment;

- building understanding of the potential and needs of member institutions, especially of those in developing countries;
- designing and implementing mutually beneficial activities such as:
 - analysing the needs of member institutions, developing a data base, promulgating outcomes, organising and conducting activities to meet those needs;
 - organising workshops, seminars, conferences and other meetings;
 - arranging and assisting fellowships, staff and student exchanges;
 - facilitating cross recognition of courses and credit transfers;
 - designing and validating courses and developing course materials;
 - identifying and securing human, financial and technological resources;
 - initiating research, development and delivery of maritime education and training to meet the requirements of the maritime industry and other stakeholders and encouraging the use of state-of-the-art methodologies and technologies;
- building membership to encompass all significant providers of maritime education & training;
- building associate and other categories of membership to encompass all stakeholders in the development of maritime education and training;
- accumulating financial resources from subscriptions and other sources adequate for the purposes of AMETIAP;
- achieving observer status at appropriate international and regional organisations;
- developing a secretariat and efficient administrative and financial systems and procedures;

Agree also that by 2010 AMETIAP shall be recognised as a highly effective organisation providing a key mechanism in facilitating the development of maritime education and training in accordance with the requirements of the international shipping industry, international maritime conventions and other agreements, as well as with recognised and appropriate academic standards and practices.

Annex 2: STCW Review.

The comprehensive review of STCW commenced at the 38th Session of the IMO Sub-Committee on Standards of Training and Watchkeeping (STW), held on 22-26 January 2007. The following consolidated list of the issues to be reviewed was agreed, subject to approval by the MSC at its 83rd session:

- retain the structure and goals of the 1995 revision;
- do not down-scale existing standards;
- do not amend the articles of the Convention;
- address inconsistencies, interpretations, outdated provisions, MSC instructions, clarifications already issued and technological advances;
- address requirements for effective communication;
- provide for flexibility in terms of compliance and for required levels of training, certification and watchkeeping arrangements due to innovation in technology;
- address the special character and circumstances of short sea shipping and the offshore industry;
- address security-related issues.

As mentioned in Gen Memos 04/07 and 06/07, Global MET members are invited to provide comment on the STCW review to the Secretariat. GlobalMET is liaising with relevant parties with a view to developing a combined submission.