Performance, Outcomes and Results
The MET Network with NGO Observer Status at IMO

*Global*MET
NEWSLETTER

GLOBAL MET
MARITIME EDUCATION & TRAINING

To promote, develop and support in the spirit of cooperation, the common interests of its members in all matters concerning the development and quality of maritime education and training.

www.globalmet.org

Inside this Issue

Articles written on behalf of GlobalMET and by other outside contributors do not necessarily reflect the views or policies of GlobalMET

Editorial

Into the Future

When we agreed to create GlobalMET in Hong Kong it was clear what we intended to achieve; we would provide a network of maritime training centres in Asia and the Pacific and assist individual institutions to develop. Now, twenty years later, our membership is world wide and we have NGO membership of the IMO. While it is pleasant to review the past, there is greater need to look to the future.

A recent survey of members elicited, inter alia, the following much appreciated response:

Q Do you agree that MET is in need of an overhaul as we move into the digital age?

Yes. Everything from STCW to education and training needs to be 'modernised' to reflect the realities of today's society, industry etc.

Q What form do you think will be most appropriate?

A radical overhaul of content, assessment etc. coupled with a blended approach to the delivery of MET should provide an outcome significantly better than exists today.

Q Should GlobalMET be involved?

GlobalMET is its members...in my view they have no option; they must be involved. I would see GlobalMET providing the leadership to enhance the capabilities of those members who have problems moving into the 'digital age'.

Q What online courses could GlobalMET provide, introductory for general interest, as required by STCW, for ships' officers, for fishermen, for coastal dwellers?

I don't believe it is the role of GlobalMET to provide courses; rather its energies should be focused on raising the capabilities of the members.

Q Would having a Learning Management System (LMS) be an appropriate approach for the administration, documentation, tracking, reporting and delivery of on-line courses or training programs offered by GlobalMET?

I reiterate that I do not believe GlobalMET should offer online courses. A learning management system is a fundamental supporting 'administrative tool' if courses are to be delivered on-line. There are many LMS available, some cost a fortune whilst others are free and available online. Having been involved in developing online courses for many years, my advice is proceed cautiously with LMS. For example; start small, start free, until these tools are understood by the users...then having determined what is actually needed decide on the degree of complexity the LMS should have.

We are preparing for a meeting in mid-June at Akademi Laut Malaysia (ALAM) - a most appropriate venue as it was to ALAM that we initially provided help with their teaching - to consider the next steps, including the establishment of a GlobalMET blog, including a learning management system and our role in the development of online learning. Your thoughts would be welcome.

As this will probably be my last meeting as Executive Secretary it will have a particular significance for me and probably set the course for GlobalMET, as well as for the person who takes over my role.

By *Rod Short*
Executive Secretary

Executive Secretary

Applications are solicited for a replacement for Rod Short, who has been Executive Secretary since the foundation of GlobalMET and is retiring.

The part-time, position is fully involved in running and developing the network and is responsible to an international Board of Directors. A passion for maritime education and training is essential, with a desire to philanthropically contribute in return for industry commitment. Some international travel is required.

Interested parties are to submit their applications not later than May to
Executive Secretary, GlobalMET Limited, rod.short3@gmail.com

It was a privilege to attend the Maritime India Summit 2016 held in Mumbai from 14-16 April. It was large, well attended by many people from India and from various countries associated with shipping and featured a very interesting exhibition and associated talks.
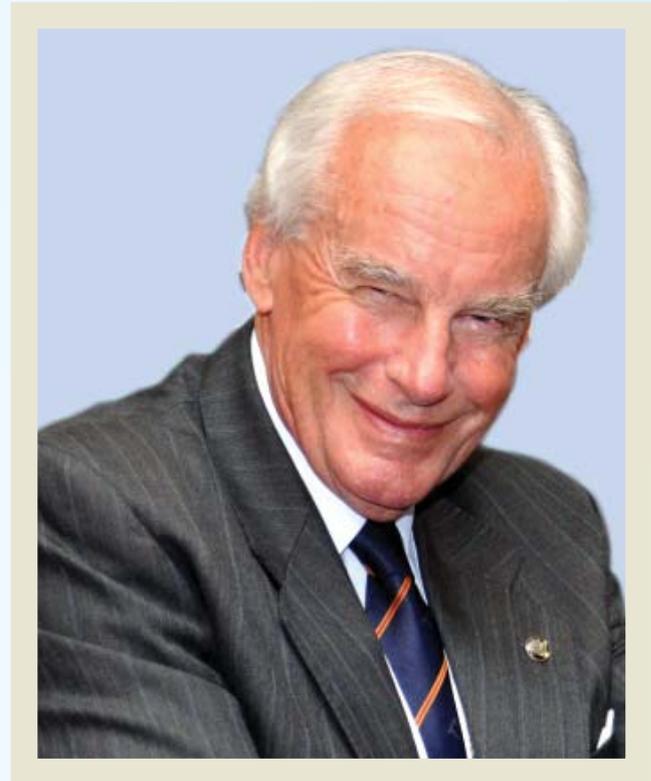
The Prime Minister of India, Narendra Modi, inaugurated the exhibition. The inaugural session included a welcome address by the Minister of Shipping, Road Transport and Highways, an address by the IMO Secretary General and an inaugural address by the Honourable Prime Minister. I wasn't able to attend this session.

The overall impression was one of desperate need to improve the infrastructure, develop the ports, develop the access to and egress from the ports, develop the port services, develop the inland waterways, develop the education and training - development right across the board. Comparisons were made with the achievements made in China.

During the rest of the Summit I attended the extensive exhibition and listened to some of the presentations. I was particularly interested in the presentation by Capt Pradeep Chawla, our chairman, who emphasised the need for skill development through education and training. Capt Chawla stated that training requirements can only keep on increasing with increased regulation and blended learning, outcome based education and on the job training will take on a greater significance in the future.

Future teachers will need to be mentors, facilitators and guides, in addition to being expert in their own subjects. Schools will be places where students go to learn techniques to apply knowledge and discuss new ideas with colleagues and experts, rather than to learn new facts.

This summit engagement will go a long way in fostering experiential sharing, common understanding and consensus building, as well as in advancing the cause of a 'global commons' in the maritime space. It will also contribute to a movement to an even better and more progressive eco-system of merchant shipping.

By **Rod Short**
Executive Secretary
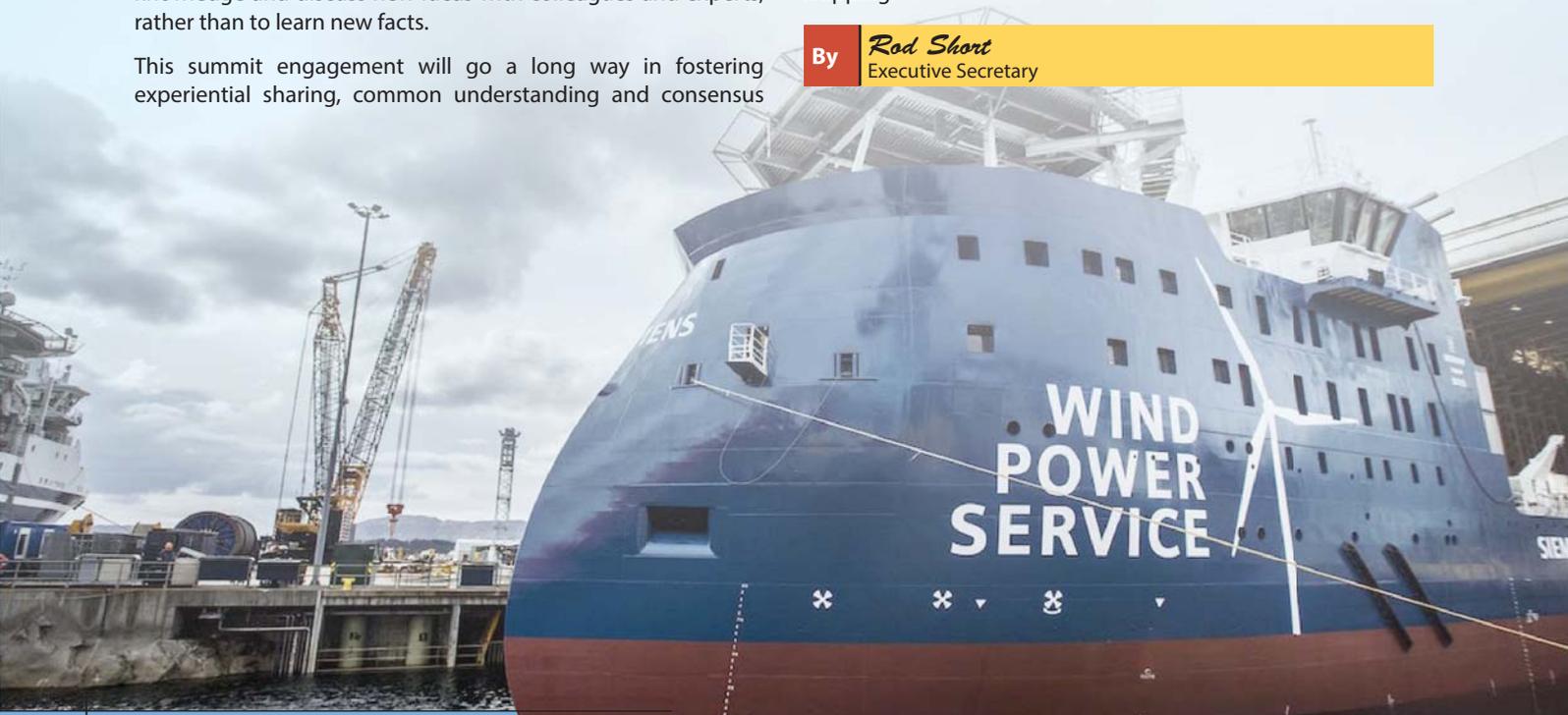
Untangling the Competence Dilemma

Employability Skills

The following table contains a summary of the employability skills as identified by the maritime industry for this qualification, **Advanced Diploma of Maritime Operations (Master Unlimited)**. This table should be interpreted in conjunction with the detailed requirements of each unit of competency packaged in this qualification. The outcomes described here are broad industry requirements that may vary depending on packaging options.

Employability Skill	Industry/enterprise requirements for this qualification include:
Communication	Complete documentation and reporting requirements on matters related to the development of emergency and damage control plans Interpret information relevant to legislative requirements to ensure the security and safety of life of crew, passengers and others at sea Maintain documentation related to legislative requirements
Teamwork	Apply team-building strategies to achieve strengthened crew and individual commitment to organisational vision and goals Coordinate crew in search and rescue operations Develop search and rescue strategy based on all available information and after consultation with others in the established chain of command
Problem-solving	Apply decision-making techniques including situation and risk assessment, identifying and generating options, selecting a course of action and evaluating outcome effectiveness Identify and solve problems that may arise during search and rescue operations, report problems and issues, and take appropriate action based on available information Promote use of problem-solving strategies and techniques to identify and generate options
Initiative and enterprise	Analyse potential collision situations and take appropriate action in ample time according to regulatory requirements Take appropriate action where noncompliance is identified Take appropriate initiative for search and rescue operations
Planning and organising	Define and document responsibilities in job descriptions for applying the environmental management plan and duty statements Develop operational plan in consultation with relevant personnel Develop security risk management plans
Self-management	Clearly define own responsibility for the safety of navigation at all times including periods when the Master is on the bridge and while under pilotage Convey a calm, confident and reassuring personal attitude Provide leadership to crew and individuals
Learning	Conduct relevant training to facilitate compliance Identify and assess training needs of crew and individuals on a regular basis according to organisational procedures Provide training on the environmental management plan procedures and practices
Technology	Conduct performance checks of navigation position fixing instruments and systems Select and use shipboard instruments to assist in forecasting weather and oceanographic conditions Use technology to store and retrieve information

Delivery of Training Programmes

Having discussed some of the principles that govern competency based approach to learning, we now address the key learning process. How must we deliver learning programmes that are actually standards (goals) based? What are we trying to achieve when we say standards-based? The STCW convention maintains that the STCW code is standards based. The standards that are stated are ignored by many learning providers. Many continue to push heavy loads of content, subject by subject, topic by topic with little or no reference to the learning outcomes, i.e. the standard of competence. Why is this so? Let us examine why.

In accordance with standard practice, we must have a standard qualifications framework that shows exactly what the learning pathways are to attain a particular qualification. The STCW code attempts to do this in their publication as amended to 2010 (Manila amendments). What this code does not do is provide or describe thoroughly the universal competency based learning, embracing outcomes based education standard of delivery, namely,

1. Volume of Learning for each level aligned and specific to the standard of competences. The use of syllabi does not fulfil this task and serves no purpose as none are aligned nor specified as performance criteria to the outcomes or standards.
2. Manner in which learning is strategically planned, conducted, delivered and facilitated at institutions, work places and other learning spaces. The latest modern educational techniques are employed and executed to the advantage of learners and teachers. All learning has moved from pedagogy to andragogy/heutagogy. The shift in paradigm from traditional knowledge based to competency based learning has become dominant in the fields of Higher Education, Vocational Education, Professional and academic degrees and Continuing Professional Development in a lifelong learning environment of learning and doing.
3. Manner in which Assessment tools are designed.
4. Manner in which assessments are conducted.
5. Measuring instruments to judge competence.
6. Manner which assessments are validated.
7. Qualifications and training for teaching staff.
8. Qualifications and training for assessors and examiners.

The STCW leaves the quality of HR development, training and qualifications to each respective jurisdiction. Unfortunately, other than a few countries that seriously went ahead to develop competency based education and training, most really had no conception of what CBETA is or what it could do for competence development and the management of competences. This inadequacy is reflected in many "training programmes" and compounds the error in HR development. These vendors seriously cause incompetence in many instances.

In this paper, the Australian New Zealand model of Training Packages is used as the example of how advanced and sophisticated CBETA and OBE has become. It has minimised the skills shortages of both countries in a very short period and proven its value as a socio-economic tool when the workforce is highly skilled and competent.

Quick tips for ensuring delivery meets the standards

It is of the utmost importance that you are qualified in the competency based learning approach and have become fully conversant with the following:

1. How we learn
2. Principles of adult learning
3. Learning styles – Kolb's learning inventory

4. Barriers to learning
5. What is competence and how should it be applied as standards?
6. What learning activities and methods suit the competences
7. How to produce a learning guide?
   a. Competency based approach, not knowledge based
   b. Qualification by qualification with specific competences
   c. performance criteria for each competence
   d. expectations in learning and preparing for learning events
   e. delivery by single competences or skill sets
8. How to produce an assessment programme?
   a. Design and nominate assessment tools for each competence or group of competences (skills sets)
   b. Ensure Open and transparent assessment programme
   c. Ensure rules of assessment applied and maintained
   d. Ensure rules of evidence applied and maintained
   e. Plan and execute Validation processes.

Assessments

The assessment processes and procedures are vital and must be conducted ethically and fairly. Assessments are conducted regularly and is part of the process of learning and doing to the specific standards. Memory examinations do not fulfil the needs to assess competence.

Learning & Assessment Strategy

Maritime Education and Training (MET) has been very slow in shifting from traditional approaches to training to a focus on the application of learning through assessing competency. This shift from a training activity to a focus on performance entails generating a significant increase in:

✘ Awareness of how people learn and trainers and training developers must do to encourage effective learning
✘ Understanding and being able to apply assessment as a pivotal role in the learning process
✘ Capability and capacity to develop and deliver competency based training
✘ Expectations by organisations that training professionals will direct their attention beyond the training activity to improve or enhance performance (an outcome)
✘ Awareness and conceptualisation of what skills and knowledge must be acquired and practised with the ability to perform as exemplary trainers, training developers/producers and assessors in a competency based learning environment.

The challenge then is for MET providers to develop training and assessment resources that enables a person to transport the skills and knowledge learnt with the right attitudes to whatever situation they may find themselves in. At the same time confidence to do well in the current situation must be instilled. Gilbert (1996) explains that performance has two distinct elements; the behaviour or activity and the outcome or accomplishment. This may be seen as the delivery of training having an activity component (presenting or facilitating) and an outcome (participant learning). It is important to note that for training to support improvements in learner performance, it needs to connect with the learner's experiences and current activities in a way that promotes transfer of learning.

Therefore, it is imperative to have qualification standards and what competences are required to fulfil the various qualifications. The STCW is intended to fulfil this role but lags in the actual description of each competency standard and the elements that are contained in the construct of each competency. Moreover, there is insufficient detail in the agreed performance criteria of the competence standards for providers to pinpoint with accuracy in a universally agreed manner. Each jurisdiction is then compelled to formulate their own interpretation standards. This has without doubt caused much confusion in the final delivery of learning and assessment strategies for learners to attain competence.

Best practice approaches to training are assessment driven. Assessment is used to recognise the learner's current competence. Comparing this information with the laid down standards shows the gaps and then what learning and training is required to close or fill the identified gaps.

It is imperative that when designing learning and assessment materials, that there be self-assessment built in so that learners are constantly enface with what is missing and hence prepare for assessments more readily. The Australian Training Package design allows this to happen, thus saving considerable time for learners to be assessed only in

what the process of recognition has discovered. This is what is called Recognition of Prior Learning (*RPL). This is quite similar to sea-time and job performance portfolios except that the current system in MET across the world has no benchmark nor standard processes in RPL. It is imperative that MET take on task this methodology. It is not new and many CoC candidates can remember appearing before the Master Attendant/Chief Surveyor- Examiner to take on the examinations without having to attend tedious months in school relearning stuff already in their experiential learning and doing portfolio.

This portfolio is not just a log book or record of on board activities as in a common journal. It must contain all the identified and agreed competences leading to the next Certificate of Competence per the STCW convention. It will describe the actual agreed activities that are aligned to the standard competences and assessed by at least three types of assessment tools and duly supervised by a qualified officer (supervisor) with proper and formal training for facilitators in competency based learning/OBE. It is this evidence of having performed to the specific criteria that can lead to final assessments for the issue of the Certificate of Competence (CoC) by the respective jurisdictions. In the past, sea-time fulfilled this pre-qualification to apply for "examinations" but the rigour of an apprenticeship no longer exists on most ships and most companies. Many learners have not picked up on any real knowledge and skills during their cadetship or when working as junior officer towards attaining the final Certificate of Competence at management level. Much to be desired has also been the lack of correct attitudes in performing their work and duties responsibly and accountably.

In competency based learning, this part of learning and doing is termed "work-based learning -WBL". It has to be well structured in competency based learning methodology, not just a running record of what the candidate or learner has done without the critical mentoring and assessment by his/her supervisor.

Principles of Assessment

First and foremost, the assessment benchmarks must be published in its entirety for all to follow. This has to be universal and in detail and not in its present loose form per the STCW. This benchmark must have details on how delivery and assessments are conducted. In particular assessments must be guided by detailed guidelines, that provide types of assessment methods, materials that reflect the competences, performance criteria and critical aspects of evidence in an evidence guide that is duly supported. This is very important as assessors cannot make second guesses nor insist on activities or demonstrations that are secret and not delivered in the training programme. The process is transparent.

Local requirements by various jurisdictions should only be additional to the standard and agreed benchmarks. All assessors must be absolutely au fait with the competency standards contained in each qualification.

A quality training framework encompassing competency based learning and outcomes based education must be standardised for all jurisdictions. This is imperative to ensure best practice in learning and teaching for learners and institutions. There are too many institutions with their own versions produced from vendors' templates that by and large are "double standards" and not suitable for the detailed high standard of performance required of institutions. This framework must be designed and produced to a standard required by law. It must be auditable and be a live document, reviewed and improved continuously, not periodically.

All institutions must ensure their teaching staff are duly qualified to deliver and assess in accordance with competency based learning and outcomes based education. IMO model courses are inadequate and remain knowledge based. Needless to say updating and upgrading these publications are imperative to attain success.

The minimum requirements for teaching staff (trainers and facilitators) and assessors are:

✘ Vocational competences at least to the level being delivered and assessed
✘ Maintain industry currency and how it is done
✘ A minimum recognised certification in delivery and assessment of MET courses and training. IMO model course 6.09 is insufficient as it not competency based praxis.

Assessment principles state that assessments must be valid, reliable, flexible and fair. Assessors must ensure that assessments decisions involve the evaluation of sufficient evidence to enable a judgement to

be made on the student's or learner's competence. Grading or marks are insufficient evidence and not acceptable.

Validity refers to the extent to which the interpretation and use of an assessment outcome can be supported by evidence. An assessment is valid if the assessment methods and materials reflect the competence - elements, performance criteria and critical aspects of evidence and are fully supported by the evidence gathered.

Reliability refers to the degree of consistency and accuracy of the assessment outcomes; that is the extent to which the assessment provides similar outcomes for students/learners with equal competence at different times or places, regardless of the assessor conducting the assessment.

The characteristics of reliability include;

- ✠ Assessing all the dimensions of competency
- ✠ Using a process which integrates required knowledge and skills with their practical application for a workplace task, i.e. holistic assessment
- ✠ Being based on evidence gathered on a number of occasions and in a range of contexts
- ✠ Covering both on the job and off the job components of training;
- ✠ Providing the recognition of competences, no matter how or when they have been acquired.

Flexibility refers to opportunities for students/learners to negotiate certain aspects of their assessment, e.g. timing, with their assessor. All students/learners should be fully informed, through the assessment plan of the purpose of assessment, the assessment criteria, the methods and tools used and the context and timing of the assessment.

Fair assessment does not advantage or disadvantage particular students/learners or groups, e.g language or culture and any undue constraints on the candidate in demonstrating the required competence due to health at the time etc.

Evidence

Evidence collected may be direct, such as observation of workplace performance, indirect such as formal testing or supplementary e.g. supervised portfolio, employer(s) suitably qualified to make judgements, recognition of prior learning (RPL), credit transfer
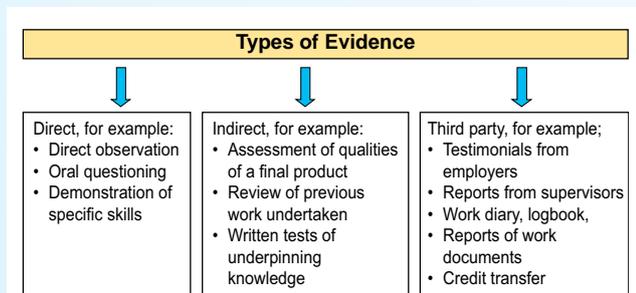

Figure 7 - Types of evidence

No single form of evidence is better than another. Quality evidence is chosen appropriately for the student and context and must meet the rules of evidence.

The **Competency based assessment** is the process of collecting evidence and making judgements on whether competence has been achieved. This confirms that an individual can perform to the standard expected in the workplace as expressed in the STCW convention 1978 as amended and the respective endorsed national standards that comply with the STCW (where they exist), on competency standards developed by the relevant industry, enterprise, community or professional group(s). or on outcomes of accredited courses if there are no nationally endorsed competency standards.

It is vital that assessments are planned and conducted in a well-structured manner and that all assessors should be using the same benchmarks and methodologies accepted by STCW.

Concluding remarks

This paper serves to introduce MET practitioners to the modernised methodology in providing competency based learning with outcomes based education techniques. The traditional pedagogy does not provide competency based learning in an institutional or work based

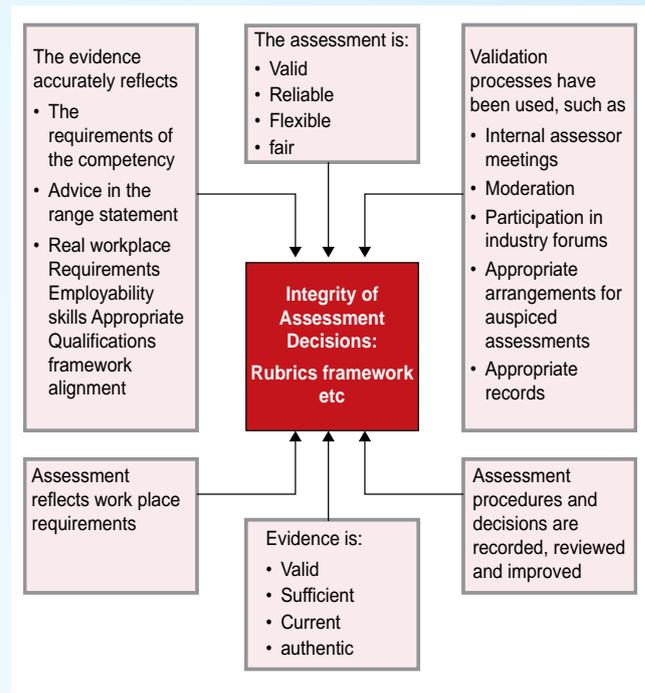The figure below illustrates **factors maximising the integrity of assessment decision**

Figure 8 - Factors maximising the integrity of assessment decisions

environment. It also does not provide the necessary transfer of knowledge skills and attitudes (i.e. competences) in the various modern learning spaces that digital disruption has brought to all of us.

Delivery of courses of training, training programmes require currency in our knowledge and skills and authenticated by ensuring all MET practitioners are in date and revalidated, with evidence of

a. Periods of return to industry

b. Updates and upgrades in certification

c. Updates and upgrades of teaching staff in learning and teaching to outcomes based, competency based learning

d. Similar updates and upgrades of organisational HRD for personnel in training and supervisory roles.

Interested persons may write to the Executive Secretary or the author at GlobalMET Ltd. The address and contact numbers are found in each issue of the newsletter or directly at www.globalmet.org

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By **Capt. Richard Teo**
FNI FCILT MAICD

Concepts on Competency and Human Performance Improvement

"**C**hange disrupts the status quo...breaks momentum and continuity in organizations, processes and performers…[c]hange shocks… out of a comfortable place...moves one [to] discomfort" (ASTD 2013).
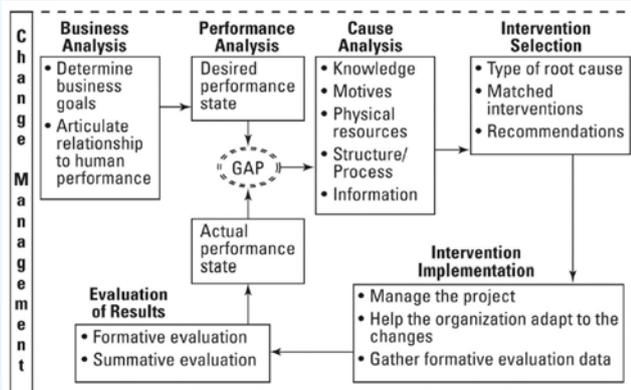

Figure 1 - Human Performance Improvement (HPI) Model

The Competency Dilemma Revisited

Last month, there was an article in the newsletter on Competency Based Education, Training and Assessment (CBETA) called– *Untangling the Competence Dilemma*. It was an excellent article, still many suggest that there is no commonly held view on this topic and just as many acronyms. It seemed only fitting that since there was momentum on the topic of competency that enhancing the discussion on outcomes in the context of performance improvement was the right thing to do.

Is the focus on competency the same the thing as performance?

The intent of this article is to inform one of the way in which Talent and Development (TD) Professionals in the Learning and Development Industry (LDI) view performance improvement issues, outcomes, and solutions; firstly, with the anticipation that it will spark more academic discussion and debate on the subject of competency and performance improvement; secondly to emphasize that training is not always the best solution for performance problems; and lastly, persuade readers of such.

All performance improvement models (e.g., the HPT or HPI models) have at least three principles in common– they are results-based, use a systems approach and see organizations as systems. Pointedly, even if training ends up being the "prescribed solution" to a needs assessment (not necessarily a training needs assessment, e.g., but as part of a performance needs assessment)– while expected outcomes in the LDI also exist, the significant difference is that outcomes here refers to "results" in terms of the business drivers and goals. This is quite a bit different than explicitly suggesting a training action, behavior or outcome is the outcome one wants or needs! All outcomes are not the same. Some may suggest minor nuances or splitting hairs here, but the difference may be as wide as the discussion on accuracy and precision for which most are familiar– one can be precisely wrong and yet can do all the correct behaviors or actions with the so called needed outcomes; e.g., climbing the wrong ladder or tree proficiently and efficiently, it's still the wrong ladder or tree no matter how it's assessed! In Human Performance Improvement (HPI), one would not prescribe training for a problem that was caused by e.g., external factors like a lack of information, resources, incentives, motivations or negative consequences. One might say neither would MET, but how would they know if they didn't look for it?

Putting things in context, Stone Age to present

In context, since the Stone Age people have been amassing knowledge, using it for survival and passing that knowledge on to the next generation; in the 1950s, 60s, 70s and 80s groundbreaking theories regarding Bloom's Taxonomy, Behaviorism, Single and Double Loop Theory, ADDIE, Cognitivism, Constructivism, Pedagogy, Andragogy, Experiential Learning, Adult Learning, etc., were abound. MET and many other training institutions have principally latched onto to a few of these concepts like behaviorism and pedagogy and have never looked back. Possibly because real change is uncomfortable and disruptive; newer concepts and paradigm shifts seem to reside outside the realm of the comfortable and possible. Why, one might ask? It seems it takes many years for "innovative" theories to find their way into mainstream application. For example, we're still talking about and using theories that happened nearly a half a century ago! We only have now really started to sink our teeth deep into Competency Based Education application and many still misapply it.

And then there was light at the end of the tunnel: Human Performance Improvement (HPI)

All arguments aside, if we were given a blank sheet of paper, knowing what we should know as lectures (facilitators) about expected performance and were asked to come up with a system and methodology to continually improve the performance and priority business results of the organization– what would it look like, figure 1 above? How then do we bridge or link the problem with "the fix"? If you notice, the word training was not mentioned. This is important and instructive in that what is it that we really are trying to accomplish? Change a performer's behavior or ensure that the performer's behavior leads to certain outcomes, more specifically– directly tied to business drivers, results and outcomes? I think the latter might be the case.

As mentioned previously, <u>a competency based outcome is necessarily not the same as an outcome tied to a business result</u> the same way that a sales person's actions or behaviors doesn't necessarily lead to the sale; lest we not confuse the sale with the seller– the sale is a unitary outcome or result we are after and not the necessarily the behaviors or actions of the seller. As some have suggested, results-based outcomes are like the difference between a noun and a verb; the result being the noun (result, report or goal) and the verb an action or behavior for which we may know little about (ASTD 2013). Other examples causing performance problems might be illogical reporting relationships, turf battles between managers and lack of accountability for outcomes.

Why does the aforementioned occur, misalignment with required business results? Whose fault is this? Clients may come with a want or need and practitioners take them at their word that this is what is required or the real performance issue.

Organizations as Systems and their meaning in HPI

In the last paragraph, it is important to see the organization as a system that also includes processes and job performers. And, as systems theory suggests– when one pushes on that system, it usually pushes back as something called "compensating feedback" and affects other parts of the system one may not have anticipated; facilitating chaos and affecting change negatively. As such, during any "fixes" or solutions to the system, change management must be an integral part of HPI and exist throughout the entire process of performance improvement. Who is your company's change champion?

And what of the other performance indicators a business has?

An organization has several tools at their disposal to determine how its performance is doing and just as many chances to make required corrections. So why the continued problems that apparently require training, but don't work? Fundamental contributing factors to the aforementioned issues may be the business' organizational and cultural frameworks that fail to address and contend with performance system issues and encourage continuous non-performing behaviors; global slumps and employment threats to the business exacerbated by issues highlighted here and possibly a lack of follow-up on management instruments such as the organization's SWOT (strengths, weakness, opportunities and threats), Balanced Scorecard (roughly how the business is doing in areas like customer, finance, process and capacity), Strategic initiatives and other broken mechanisms. This is proof that not all of an organization's ailments are about training. For example, minimal focus on real performance solutions; competency issues related to business results; alignment in structure, process, and priority performance requirements; which brings us to where we presumably are today—seemingly not yet competent (NYC) in many required and important areas concerning maritime competencies, industry and MET as evident by the continued high number of catastrophes each year.

The Mechanics of HPI and Results-Based Outcomes

For the record, the results-based approach always works in the following sequence:

- Identify an organizational problem or goal.
- Articulate a relationship between the problem or goal and human performance.
- Determine a quantifiable performance gap between the desired level of performance and the actual level of performance.
- Conduct an analysis of the root causes to reveal the reasons for the performance gap.
- Implement a series of solutions to address the root causes.

Another big part of the problem is the organizational culture piece mentioned earlier that supports and feeds to the "performance misalignment" and the perception that there is no problem; continually doing the same things one has always done before; then one will continue to get the same things they've always gotten—most of us have heard this or another version of it many times before? Performance incentives and rewards programs also feed the same beast of distorted continued cyclical behaviors and outcomes. There are, however, enough fingers to point all around– from top to bottom.

And lastly, I conclude with the stark retelling of the story of the boiled frog. It's been said that if you put a live frog in a pot of water and slowly bring the pot to a boil, the frog will stay in the water until it is completely boiled and cooked to death. Are our organizations in MET like the boiling frog? Maybe we don't know if we're in hot water and are being cooked to death because we fail to change.

A metaphoric realignment of the organization, process and job performance based on goals, results and priorities may be required to help ensure our survival. Inexorably, however, I believe the cycle will endure as it must just as summer follows spring and winter fall! Have a look at and take part in a MET Performance Needs Assessment today, http://goo.gl/forms/3xbYV45ZJj . And, as always– hope to see your article and comment soon– see you on the blog.

Reference

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By **Iman Fiqrie Bin Muhammad** (LCDR, USN ret)
Lecturer, Malaysian Maritime Academy

Moon + Reader Pro and Speech to Text

Technical Highlight

by
Iman Fiqrie

All text and PDF readers are not made equal! If you're looking for a powerful Text-to-Speech (TTS) mobile application, then Moon+ Reader Pro is it. I've personally used a few TTS before but never with so many full feature, powerful controls and functions.

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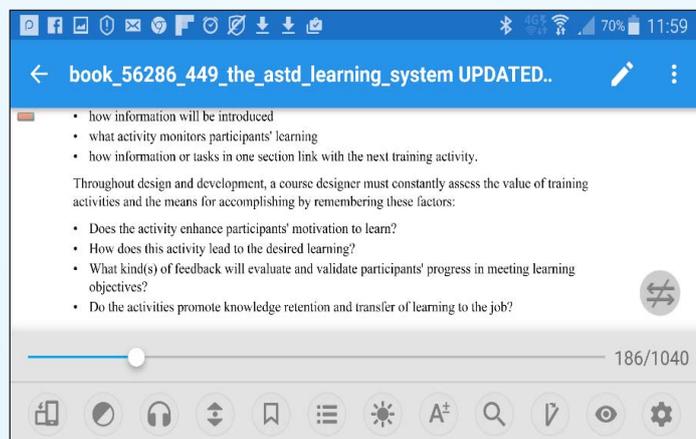
Navigation in Restricted Visibility - 'RV'

I have observed that the knowledge or understanding of watchkeeping requirements and actions to avoid collisions in 'RV' is seriously lacking, for the latter most answer that they would use only the sound (fog) signals, not the radar or even the AIS. Correct scores of collision scenarios in 'RV' hover around 40 % in my many open book surveys.

'The term restricted visibility means any condition in which visibility is restricted by fog, mist falling snow, heavy rainstorms, sandstorms or any other similar causes', as defined in Rule 3(l) of the International Regulations for Preventing Collisions at Sea, 1972, as amended, 'IRPCS' in short. Similar causes can be many, smoke from Indonesian forest fires, for example.

Watchkeeing requirements are covered in sections VIII/2 of the STCW Convention. The mandatory Code A states in paragraph 45: *'When restricted visibility is encountered or expected, the first responsibility of the officer in charge of the navigational watch is to comply with the relevant rules of the International Regulations for Preventing Collisions at Sea, 1972, as amended with particular regard to the sounding of fog signals, proceeding at a safe speed and having the engines ready for immediate*

manoeuvre. In addition, the officer in charge of the navigational watch shall:

.1   inform the master;
.2   post a proper lookout;
.3   exhibit navigation lights; and
.4   operate and use the radar'.

An earlier paragraph 37 states: *'The officer in charge of the navigational watch shall use the radar whenever restricted visibility is encountered or expected, and at all times in congested waters, having due regard to its limitations'.*

Collision avoidance in 'RV' is primarily governed by Rule 19 alone, which is in section II of Part B of 'IRPCS'. It applies independently, though in conjunction with Rules 4 to 10 from section I of Part B, Rules 11 to 18 from section II of Part B do not apply with Rule 19 as they *'apply to vessels in sight of one another'* only. This is important to know and understand with respect to applying the correct Rules.

The below chart explains the various paragraphs of Rule 19.

	Text from the rule	Explanation
a	This rule applies to vessels not in sight of one another when navigating in or near an area of restricted visibility.	Defines the application, *'vessels not in sight of one another'* and *'when navigating in or near an area of restricted visibility',* both conditions must exist together. Note, this rule applies to all vessels. Restricted visibility is as defined in Rule 3(l).
b	Every vessel shall proceed at a safe speed adapted to the prevailing circumstances and conditions of restricted visibility. A power-driven vessel shall have her engines ready for immediate manoeuvre.	Reconfirms the application of Rule 6 on *'safe speed',* with a cautionary note, *'adapted to the prevailing circumstances and conditions of restricted visibility'.* Requires that every *'power-driven vessel shall have her engines ready for immediate manoeuvre',* which practically would mean propulsion machinery kept on standby and ready for immediate use.
c	Every vessel shall have due regard to the prevailing circumstances and conditions of restricted visibility when complying with the Rules of section I of this part.	This part means Part 'B'. Section I of Part B contains Rules 4 to 10, which as stated in Rule 4, apply in all conditions of visibility, so nothing new here. This paragraph only reconfirms that compliance with Rules 4 to 10 is a must even in restricted visibility but with a caution regarding *'prevailing circumstances and conditions of restricted visibility'.* This requirement also clearly implies that section II Rules 11 to 18 do not apply with Rule 19, and thus neither the Rules nor their titles or terms should be referred to with Rule 19, except the word *'overtaken',* as explained further below.
d	A vessel which detects by radar alone the presence of another vessel shall determine if a close-quarters situation is developing and/ or risk of collision exists. If so, she shall take avoiding action in ample time, provided that when such action consists of an alteration of course, so far as possible the following shall be avoided:	The first sentence is essentially a repeat of the requirements stated in Rule 7 which apply *'in any condition of visibility',* except that observations shall be done *'by radar alone'.* A major difference is, that the determination also includes if *'a close-quarters situation is developing'* and not just *'risk of collision'* as stated in Rule 7, till here the requirement are a repeat of Rule 7. *'If so'* means that the answer to the determination is yes. *'She shall take avoiding action in ample time',* is a repeat from Rule 8(a) and clearly implies both vessels *'shall take avoiding action',* it may be noted that Rules 16 and 17 (give-way / stand-on) do not apply with Rule 19. The Rule allows freedom of action without saying so and can be linked back to Rule 8(b) clause *'any alteration of course and/or speed to avoid collision'.* It is thus for an OOW / navigator to make a choice and execute the same such that it is *'large enough to be readily apparent to another vessel observing (visually or) by radar',* also from Rule 8(b), but the *'visually'* element will automatically not apply in 'RV' conditions. *'Provided that when such action consists of an alteration of course',* should be linked back to Rule 8(c) clause, *'if there is sufficient sea-room, alteration of course alone may be the most effective action',* which should always be the preferred choice because changes of speed may not be *'readily apparent to another vessel'.* Turning is fast and requires little sea room. *'So far as possible the following shall be avoided'* – is to avoid the actions stated in subparagraphs 'd-i' and 'd-ii'. This clearly implies action opposite to which *'shall be avoided'.* *'So far as possible',* is a typical escape clause which feature with many Rules and should ideally be disregarded, unless the circumstances and conditions impose such restrictions that the normal stipulated action is impossible to execute. Best actions under both sub paragraphs are shown in the below diagrams.
d-i	An alteration of course to port for a vessel forward of the beam, other than for a vessel being overtaken;	
d-ii	An alteration of course towards a vessel abeam or abaft the beam.	Both vessels have each other forward of their beam, each alters her course to starboard, Rule 19(d)(i) The one overtaking has a choice of altering her course to port or starboard by Rule 19(d)(ii). The one forward can only alters to port by Rule 19(d)(i)
e	Except where it has been determined that risk of collision does not exist, every vessel which hears apparently forward of her beam the fog signal of another vessel, or which cannot avoid a close-quarters situation with another vessel forward of her beam, shall reduce her speed to the minimum at which she can be kept on her course. She shall if necessary take all her way off and in any event navigate with extreme caution until danger of collision is over.	Is applicable in situations where an OOW on a vessel hears the fog signal of another vessel forward of the beam, and it is not known or has not been determined if the other vessel is passing clear without any *'risk of collision',* or *'a close-quarters situation'* cannot be avoided with this vessel forward of the beam, irrespective if her fog signal has been heard or not. This paragraph 'e' actually does not specify any clear action, all it says *'shall reduce her speed to the minimum at which she can be kept on her course'* or heading, or stop the vessel dead in water. And *'navigate with extreme caution until danger of collision is over'.* It is left to the prudent judgement of navigators to decide between these two options and continue to do so till they feel that the *'danger of collision is over'.* It is interesting to note that the word used here is danger. Rule 35 prescribes *'sound signals in restricted visibility',* these are generally called 'fog signals'.

It may be interesting to note that paragraphs 'b', 'c' and former part of 'd' have nothing new in them and paragraph 'e' uses the word 'danger', the ending word of the very important Rule 2 is also 'danger'.

To be continued

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Evolution Aspects in the Marine Simulator Domain

Other systems of maritime simulation such as engine room, cargo handling and communication seem to have lagged behind in their development. This is however not so much related to the realism and sophistication of the mathematical models used as well as to the presentation of the various components and items in the simulated environment. But the realism of the environment is definitely necessary in the context of the STCW95 requirements where the competences shall be demonstrated and assessed in a situation which is as realistic as possible.

Along a somewhat different pattern than the bridge simulators is the development of engine room simulators, whereby the automation of the engine controls was a main trigger to create modern, realistic learning tools for these processes. As the simulator should replicate the working environment as close as possible, the engineroom design set the route.

Some 10 years later than the bridgesimulators the engineroom automation development facilitated the first engineroom simulators into the market:

1966 Enter the first applications of engine room automation which would finally lead to engineroom designs as we know them today.

1972 First commercial computerized engineroom automation system for diesel engine powered vessels,

1978 Dieselsim from Norcontol (presently Kongsberg Maritime) from Norway is considered one of the first computerized diesel plant training simulators. This became the basis of the further expansion of engine room component in training simulators.

1985 Extension into marine systems process simulator which incorporates vital components such as main engine remote control, engine-room local panels, controllers, engine telegraph, alarm systems, power supply switchboards, engine sounds, etc.

From the educational point of view constructing a replica of the engine control room is the first area where efforts have been made by the manufacturers. As the required space, size and equipment is limited in an ECR, this development has been achieved to realistic levels.

The next stage is the representation of the actual engine room itself. Numerous tasks and functions have to be performed by the duty engineer on board and thus the same tasks will have to be trained by the trainee engineer in the simulator. But how to represent a full engine room in a simulated classroom environment is the real challenge to be overcome.

Different solutions have been conceived:
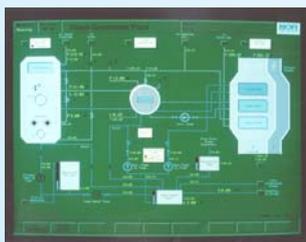
Desktop graphic representation of ER systems

- ⤬ screen based workstations showing all the engine room subsystems on a single computer screen

- ⤬ man size mimic diagram boards, both active and passive showing all the subsystems in the engine room
- ⤬ screen based workstations spread through the engine room space each representing selected subsystems at each position
- ⤬ local operating panels being hardware controller boxes for each subsystem
- ⤬ full size mock-up ship's engine, at selected points connected to the simulation models

Active mimic diagram showing ER systems

**Workstations physically spread around the ER space**

Local controls spread around the ER space

Real engine made into ER simulator

With the exception of this last alternative, each of these solutions has the disadvantage of the limitation of the realistic engineroom environment such as is encountered on board a real vessel and which is required in order to demonstrate the various competences described in IMO's STCW tables.

In order to compensate for this, one of the latest developments is the presentation through projection of the engine room interior in a virtual manner on man-size screens creating the impression of being inside the engine room. By means of a joystick type device it is possible to walk around in the engine room and operate the various engineroom components which are driven by the simulator model servers.
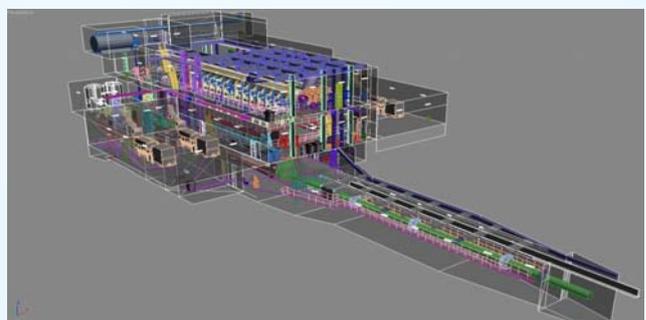
Extent of the vessel modelled in the virtual ER simulator

In this way a virtual walk/watch can be made through all areas of the engine room, gauges can be inspected, controllers operated, levels checked. The trainee can return to the engine control room to further stand the watch as is required in the specific training scenario. Indeed the development of software

tools in the gaming industry has boosted the possibilities for these solutions.
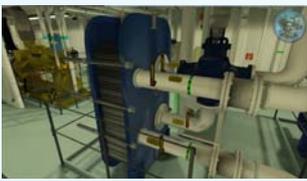

The hands-on engine control room

Into the VR engineroom

Main engine in VR representation

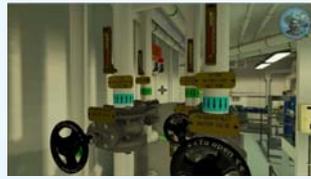**Operatable control unit in VR engine room simulator**

Cooling unit in VR pipeline systems

All operational purifier section in VR engineroom

Main engine cylinder tops

Valves to be operated in the VR engineroom

Hull side of VR engineroom near main engine

Steering gear engine responding to rudder commands

Entire shaft tunnel with moving propulsion engine shaft

This projected engine room image has a number of characteristic advantages:

- strong impression created, as in the bridge simulators, due to the virtual graphics
- projected software is easy to change into other engine rooms configurations
- unlimited size engine room interiors can be fitted in a minimal sized schoolroom
- all functions processed in the mathematical models running the simulator programme can be made available to the trainee.

As shown in the illustrations the operations taking place onboard the real vessel can be replicated and performed to a realistic level. This can include various types of training, ranging from component training, to decision making training and engine room resource management roleplaying scenarios.

It is without doubt that these developments are adding a whole new scope to the realism, attractiveness and subsequently to the learning results on the engine room simulators. Credit is herewith also given to the sophistication of the complex mathematical models which are at the core of any realistic engine room simulation by raising the level of the virtual presentation to the same high standard.

Pictures courtesy Kongsberg Maritime, Norway
Pictures of VR Engineroom by Maritime Institute Willem Barentsz, The Netherlands.

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Training Highlight

Flashlight

by
Iman Fiqrie

Facilitator Self Check

- Am I giving people equal time?
- Am I helping people feel safe enough to participate?
- Am I helping people who tend to dominate allow other people to speak?
- Am I avoiding choosing sides?
- Am I handling conflict?
- Am I managing my time?
- Am I involving people who don't participate?
- Am I summarizing learning points?

(ASTD 2013 Learning System)

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