

Competency Gap: a technology solution with “Knowledge at Work”

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The maritime world is facing a crisis in supply of capable maritime manpower, at sea and ashore. There is also an acute shortage of maritime teachers. In many places, the maritime training infrastructure is inadequate. What can be done to maintain the supply of knowledge workers that is so vital to the maritime industry? The paper dwells on this issue and critiques the existing system of maritime education and training (MET). It recommends a progressive, yet revolutionary change using information technology and networked learning. It talks about a maritime training platform that will host quality curriculum in fulfilling the needs of the maritime industry. It talks about utilizing a world-wide pool of maritime trainers and e-learning experts that could assist the corporate as well as the MET institutions in technology handholding that will lead to delivery of training at an affordable cost as well as improve the learning outcome.

KEY WORDS

Maritime Education and Training (MET); e-Learning; Learning Management System (LMS); Networked Learning; Blended Learning; Corporate Training; International Convention on Standards of Training, Certification and Watchkeeping (STCW); IMO sub-committee in Standards of Training and Watchkeeping (STW), Information and Communication Technology (ICT), Information Technology (IT).

The maritime world is facing a crisis in supply of capable and qualified maritime manpower, at sea and ashore. There is also an acute shortage of young and capable maritime teachers in Europe and Asia. The training infrastructure is inadequate in terms of available programs as well as facilities. Quality control in many MET schools is lacking. Many institutions are not able to provide quality graduates or provide continuing capability development of maritime workers that meets the needs of the industry. Shipping companies are now setting up their own in-house training and yet struggling to close the competency gaps that exist within the industry.

With the growth in trade, increasing number of ships, inappropriate crew and less than perfect shore-based management, the risk of shipping casualties can only be on the rise.

What can be done to improve the situation?

While the reward factors of going to sea continue to slide in the developed world, new geographic regions for recruits will be exploited and found. The mixture of experienced officers from traditional supply countries and raw intakes from newly established regions will become a trend on shipmanning. But the only way to maintain a balance that will sustain the maritime operations will be to maintain a “focus on quality training” and

building up a corporate culture that cares about the well-being of crew on a longer term and provides for continuing professional development of the maritime workforce.

The above appears to be an obvious proposition without needing much deliberation, but who will undertake this effort?

For shipping companies, this will require investment in training that they are neither willing nor afford to do; also, the shipping companies are no experts in providing training. In most cases, the in-company training set-ups amount only to “screening” centers rather than full-fledged maritime academies.

The established and well-funded maritime institutions are normally well-wrapped and engaged with their system of bureaucracy that is tested and continues to serve them well. They are, understandably not driven or geared for experimentation or innovation.

This paper is an outcome of that provocative thinking where application of technology takes a huge position within the curriculum structure and the process of its delivery. The discussion will include some examples of such technology solutions. Success will rest on the maritime community’s decision to either enthusiastically embrace such an approach or to remain within the enclave of established traditional mores that are failing to provide answers to the current challenges.

Identification of Challenges

The current situation within the industry in terms of growth in shipping, the technology employed on ships, and the need for sophistication in ship management:

- Growth in Shipping: exponential growth in number of ships and tonnage over the last decade

- Congested waterways leading to more accidents
- Increasing Legislative and Environmental Regulations in place to protect life and environment that affects vessel operation
- Technology on board and ashore: Electronics, Automation and IT, Higher vessel speed and power ratings, Increasingly complex and fuel efficient power plant design, Increasing monitoring and control of power plant and ship movement from ashore, sophisticated shipbuilding technology, modular ship construction, improved hull design and painting technology, application of welding and materials technology advances, emergence of specialist ship designs: MPP, LNG, Car Carriers, RO-RO etc.
- Advanced Communication : ship to shore connections, use of cell phones, broadband and satellite connectivity
- Ship Routing and Monitoring: ship movement under closer scrutiny by all stakeholders in business
- Business Challenges: availability of ready business information on the internet and intranet forcing the need for use of sophisticated decision making tools in chartering, ship management, insurance, purchasing, vendor selections and many other aspects of ship-owning and ship management.
- Quick Cargo Turnaround in Ports: Cargo handling technology, remote operation, mechanization
- People on board and ashore: specialists and professionals; need for MET that is able to produce graduates that are industry-ready, who are able to perform as new recruits, can train on the job and are also capable of continuing capability development through advanced MET and management education.
- Psychological Challenges faced by seafarers: As a start-up career, he must accept the inadequacy of training with which he joins a ship, the unsocial hours that he must stand a watch and the loneliness in the company of people that he is not familiar with, he must agree to spend a number of months away from his family and friends, he must accept the perils of the sea that includes chance of occasional piracies and, or becoming a victim of terrorism. He must also become used to the monotony of unpalatable food and lack of adequate rest while on congested waters or under emergency situations on board. The rewards of being at sea are enormous, but at the start-up, the challenges appear overwhelming, especially for those with alternative career choices.

Industry Feedback

1) 22 March 2007 Lloyds List :
 “GROWING incompetence among crews, possibly brought on by new recruits, poor retention and overworked seafarers, could be the reason behind an increase in the frequency of serious maritime accidents since the start of the new century, Det

Norske Veritas has said. Data released by the Norwegian classification society at the Connecticut Maritime Association conference purports to show that while accident figures today are half of what they were in the late 1980s, “the trend is about to turn”. This reversal has been clearly felt and seen since the start of the present decade, according to DNV data. Tor Svensen, chief operating officer of DNV Maritime, told Lloyd’s List that this unwelcome reversal of the trend could plausibly be attributed to a “loss of competence” among crews, linked with stress and fatigue but not necessarily attributable to fewer crew members per ship. Dr Espen Cramer, head of DNV Maritime Solutions, said in a statement: “In sum, the general level of experience on board vessels has been reduced. There are more new recruits, less retention and faster promotion.”

2) Gulf Maritime Conference, held at Expo Centre in Sharjah, Wednesday, 25 April 2007:

“The global shipping industry is in the midst of a serious manpower crisis, warned Captain Athar Shafique. According to industry reports, the world’s merchant fleet suffers a continuous shortage of around 10,000 qualified officers or 2% of the total global officer workforce. Among the reasons given at the conference for the shortage of seafarers were lack of motivation to join ship as seafarer, lack of sponsorship from shipping companies for training future workforce, lack of sea berths for cadets to complete their sea time, stressful working conditions on board, criminalization of seafarers, employment barriers placed by flag states, increase in number of ships worldwide, and increase in high-tech or specialized ships. Shafique also attributed the shortage of seafarers to the lack of maritime institutes capable of producing cadets.”

3) STW 39th session: Opening address by E E. Mitropoulos, Secretary-General of the IMO, 3 March 2008, London

“Although the wide and effective implementation of the STCW Convention can ensure that seafarers are properly educated and trained to meet the needs of safe navigation, their supply in sufficient numbers worldwide continues to cause concern, in particular when seen against the anticipated shortage of some 27,000 officers representing almost 6% of the total by the year 2015 and when set against the recent, unprecedented rise in orders for new buildings. Once delivered, these increasingly sophisticated ships will be entrusted to seafarers who must be competent in all respects to sail them in a safe, environmentally-sound and efficient manner. And there the problem starts.”

4) The Hindu, April 05,2008

“Industry estimates point that the worldwide demand for seafarers is 4.76 lakh officers, as against an availability of 4.66 lakh. It is estimated that this shortfall of 10,000 may nearly treble to 27,000 by 2015, as new orders for ships have increased and scraping has dropped. The world shipping fleet is growing at about 3%, with new orders totaling nearly 50 per cent of the existing fleet size.”

5) The Star, Malaysia, Monday April 14, 2008:

Malaysian Shipowners Association (MASA) chairman Nordin Mat Yusoff (also vice-president (fleet) of MISC Bhd): “The

current deficit of about 10,000 seafarers can increase to unprecedented levels in the next couple of years. The worldwide number of seafarers is estimated at about 1.2 million The crew shortage is apparent in relation to the number of ships currently on order, totaling 8,000 vessels, with deliveries averaging 2,000 ships annually over the next three years, staggering 20,000 new crew members, from junior officers to master mariners (at an average of 15 crew members per ship), would be needed to meet the demand of new ships deployed every year”.

The feedback from Industry appears unanimous that:

- Shortage of seagoing officers, who are properly trained, will progressively worsen.
- Attracting young people into sea-going is not easy and there is difficulty to retain them at sea.
- Majority of MET facilities are not capable of delivering the quantity and quality of graduates, needed by the maritime industry.

Economics of MET: Subsidy, Investment and Returns

The economics of simple demand and supply would suggest that even with 1% growth in world fleet, the demand will surpass the supply by 46,000 officers within year 2010, (Source: BIMCO ISF 2000 Manpower Update) and we are already close to that. Given such estimates it would appear to be a good idea for a business to get into. However, MET is a hugely capital intensive business. It requires specialist management skills in dealing with the shipping industry and the regulatory bureaucracy that demands immense commitment with a very long term projection for a return on investment (ROI).

Cost Drivers and Return-On-Investment (ROI)

The capital invested in the infrastructure remains an important item since with a small investment, MET will have to remain within a “chalk and talk” classroom domain. This is a major problem in development of quality MET in the third world, in particular where Government subsidy is either unavailable or at its best inadequate.

Comparison of Cost: Subsidized Singapore and privately funded Indian MET

| Major Categories of Expenditures for the Year | Singapore (SGD) : Govt aided | India (Rs): Privately funded | Converting to SGD for Indian Ops |
|---|------------------------------|------------------------------|----------------------------------|
| Expenditure on Manpower (EOM) | \$9m | 11m | \$0.44m |
| Other Operating Expenditure (OOE) | \$0.7m | 19m | \$0.76m |
| Administration and Management | \$0.3m | 39m | \$1.56m |
| Total | \$10.0m | 69m | \$2.76m |
| Student No | 870 | 700 | 700 |

| | | | |
|---|----------------|---------|-----------------|
| Fees Collected | \$1.3m | 117m | \$4.68m |
| Government Grant | \$8.7m | NIL | NIL |
| Academic Staff FT | 60 | 30 | 30 |
| Academic Staff PT | 04 | 10 | 10 |
| Support Staff | 25 | 40 | 40 |
| Total Staff | 89 | 80 | 80 |
| Teacher/ Student Ratio | 13.6 | 17.5 | 17.5 |
| Annual Average Salary of Academics | \$100,000 | 600,000 | \$25,000 |
| Annual Av Salary of Support staff | \$40,000 | 250,000 | \$10,000 |
| Staff Training & Development | \$40,000 or 4% | 125,000 | \$5,000 or 1.8% |
| 5 Year Development Budget for Furniture & Equipment (F&E) | \$5m | 200m | \$8m |
| Capital Investment in F&E (without land and building) | \$20m | 117m | \$4.68m |

The example above indicates a typical scenario where a healthy and thriving Institution in Singapore is compared against a private enterprise in India that must fund itself from operating surpluses and is dependent on student fees and support from the shipping industry.

To make such a private enterprise sustainable, one will need support from the industry (sea berths, training subsidy etc.) as well as stamina to struggle through a relatively long payback period (in the example, the Indian Institution will need close to 7 years of uninterrupted operation before realizing a contribution of near \$2m/year from its operation – this does not take into account the investment in land and building). As a further example, to construct a MET school close to Mumbai, that will have a capacity for 800 full-time students on a land area of 23,000 m² the budget for capital investment is estimated at S\$20m. Such commitment is not easy to come by and this paper can only encourage those with an eye for enterprise and a brave heart.

To my knowledge, none of the privately funded MET colleges have tried to raise capital funding from the equity market and unless they are operated as non-profit trusts, I see no reason why this cannot be done at some point in time where the institution has established a good track record and can assure the shareholders a good return and a healthy growth projection.

Well funded government aided schools have the resources to keep up with expectations and could certainly do much more in

becoming more efficient and improving the outcome of MET by producing quality Graduates. However, in reality, the story is somewhat different.

Categorizing schools within the Global MET

The MET schools in the Asia-Pacific region established the Association of MET in the Asia-Pacific or, AMETIAP in 1996. Now the organization has close to 100 member institutions and a consultative status at the IMO. Studying the list of schools within the Global MET, the author has categorized the capable and well-established “A-schools” providing a whole range of maritime education up to Diploma, Degree and professional levels. But these made only 30% of the cohort. Almost 80% of these A-schools receive subsidies from the Government or some such bodies as the Unions and only 20% of them are private enterprises. The next category of “B schools” that are limited in scope and focusing on particular areas of training like STCW short courses or similar, makes 43% of the membership; and schools that are providing marginal services like electronic learning, e-learning or specialist training and/or are very limited in capability and scope, fills the remaining 27% of the Global MET cohort. Only 19% of the B-category schools and 3% of the C-Category schools receive any form of subsidy. (Please Refer to Annex 2).

While all can debate on the author’s right to categorization and his soundness of judgment for such classification, the analysis is only useful in understanding that there are only a handful of capable MET schools that can provide quality education and the majority of them are subsidized. This will be apparent if one visits the few privately owned A-schools within the list: all of them suffer from the lack of quality laboratories, workshops and simulators when compared to their subsidized counterparts. And the subsidized A-schools generally lack the drive, the enthusiasm and enterprise that are core to any innovation, and prefer instead to remain on a practiced path that worked for them in the past.

Quality of MET and Resources

Considering the challenges faced by seafarers and the demands of the industry, one would wonder the efficacy of the IMO and STW committees in creating the right training curriculum, implementing that correctly and monitor the quality of training being delivered across the member countries. While the Port State Control inspections have contributed significantly in upholding the STCW standard, in the author’s opinion, the quality of MET will continue to differ between countries based on the quality of individual nation’s educational grid and commitment for investment in MET. There is a huge tendency in many governments to expect the maritime industry or the private educational enterprise to pay a major share of the necessary infrastructural investment in MET. This, in my view, will be difficult to harness and gear towards a sustainable and organic growth in MET. For example, while the government aided MET institutions in India are adequately equipped with the training infrastructure and resources, the same cannot be said

about the privately owned MET or schools that are run by the shipping industry interests. In particular, those with limited resources will find it progressively difficult to attract students who may have alternative professions to choose from.

Supply scenario today and a possible tomorrow

The reality of the situation can be seen from the published data by the World Bank (Please refer to Annex 1). The relatively prosperous nations with high GDP do invest heavily in education (5 -6%); but the less prosperous and highly populated nations do the reverse. This has resulted in poor quality of high school education and is an impediment for post secondary and university education. This makes it difficult for MET to succeed as well. A good example of that is Indonesia with a large pool of untrained manpower and perhaps an even better example will be in Philippines where, in spite of being the “largest and the most stable” source of shipping manpower in the world, the quality of MET has been less than encouraging and inconsistent. In this table, the author has identified tier1 and tier 2 level countries that could be considered for MET investment: this is based upon the available information on the quality of secondary education, the recent history of MET in that country, the young population density and the government’s commitment to establish basic educational infrastructure and the use of English as a medium of instruction.

Countries that will attract ready attention and perhaps more investment in MET will remain - the Philippines, China, India and progressively South Africa, Kenya, Mexico, Brazil, The East European nations, Poland, Thailand and Vietnam will be added.

With rapid economic growth, both China and India are finding manpower shortages within their own merchant fleet and port and shipbuilding industry: shortages have become more acute for China than India. But for India, the problem appears to be in attracting young talent from other industries, in particular the ICT areas. A young graduate in IT can earn an entry level salary of \$1,000 per month that can go up 3 times within 5 years; this provides for a comfortable living: not forgetting the opportunity to migrate to the OECD nations with a salary comparable to sea wages and with a better quality of life proposition. The tuition for MET education also remains much higher than other disciplines, e.g., ICT areas. So, in both these countries, it will be progressively difficult to attract students taking up to sea. That only leaves Philippines and the author anticipates more enthusiasm and investment into Philippines by the world shipping within the next decade. The challenge for the Philippines is to reform its secondary education and strengthen the curriculum of Science, Mathematics and English. Being the source of an eager and established seagoing community, with support from the government and the trade unions, the future for MET in Philippines appears strong. The private investment in MET is pouring, but the audit regime in controlling the quality of maritime education and training will remain a challenge here.

Shortage of Maritime Teachers

One common denominator of MET challenge in all three countries and perhaps worldwide is the shortage of quality maritime teachers. Teaching salaries are appallingly meager when compared to their sea-going or shore-based counterparts (ship superintendents, port engineers, surveyors, shipyard managers etc.). This has resulted the practice of using part-time faculty, using on-leave ships' officers or older teachers with limited experience of recent shipboard technology and operational practices. Tenured or permanent staff that should motivate and inspire, instead are jaded and remorseful and often encourage students to switch to other professions. In the author's view, this is a formidable stumbling block against progress. The educational leadership is often engaged in resolving internal conflicts and maintaining status-quo, seldom able to create a conducive learning environment that promotes innovation and enterprise in education. And those who have that insight suffer from inadequate resources and lack of internal support from the management that remains stratified, overzealous and controlling.

Within my experience, I have seen many ships officers who join the faculty with many fresh ideas, soon getting institutionalized within the culture of a supervisory regime and reporting system that demands "loyalty" to established norms first before encouraging innovation and enterprise from staff members.

The shore based maritime industry

The author shall now highlight some of the challenges of the shore based management: part of which is inherited from the sea and part of which is in its inability or inertia to learn from other industries and a resistance to change.

The era of traditional shipping companies, many of them family-owned, has waned and ship management companies that only manage the ship operations have taken leadership regarding how this industry should progress. This has resulted in tremendous competition amongst ship managers since the "barriers to entry" in this business are low. This has, over the years eroded the "loyalty" factor that the seafarer had towards a shipping company. And the seafarer has been a "pawn" in the chessboard of the management business where cost focus has been a major factor in survival as well as surreal greed. Any downturn in freight rates and management fees will always translate to cost cutting in training, reducing cadet births on board or even better, stop training altogether and "poach" trained crew from other companies – the effect of which is never evident the next day or month but perhaps responsible for the cancerous deterioration of faith and image of this industry.

The other equally serious issue is the attitude within the ship manager community; that they can learn all that is necessary, on the job itself and there is no need of further education and training. This has resulted in a so-called "management by telephone" and more recently "on the blackberries", where all problems are resolved by bringing together various stakeholders

like the repairer, the yard, the supplier, the class surveyor and facilitating an operation within budget, appears the only focus. But the underlying learning, knowledge transfer and appreciation of new technology in problem solving have all taken the back stage. In comparison, If one takes a wider view within other industry parallels in aviation, in transportation, in refinery and plant operations and even within the hospitality business, most managers are extremely aware of their personal "capability development" needs; without which they have a fear of losing their jobs. But a ship manager? No, he is so valuable to the business that at any moment of conflict, he can simply walk over to another job with a better salary and matching perks. With that environment, it is likely that any idea for continuing education will go flat against a ship manager controlling a million dollar budget and a boosted ego, even though his education stopped at the "competency to run a ship" level.

In the author's view, the change must start at the management level in shipping. Continuing education for the ship manager will be important in bringing better efficiency and effectiveness and will also be helpful in developing the right attitude and sound action plans within the business of seafaring: be it the towards crew welfare or their education. In the author's view, the ship manager education must happen in the areas of new technology, application of ICT in business, Insurance and law and in human resources management

Summarizing the Challenges

- It will be progressively difficult to attract and retain people at sea
- Quality of MET will remain varied across the globe
- MET is capital intensive with a long term ROI; thus while the demand for seafaring officers will escalate, the quality schools will remain in short supply
- Subsidized MET schools are better resourced but lack enterprise
- Privately owned MET needs more help in adequate physical infrastructure.
- Quality MET teachers are in serious short supply
- Continuing education for ship managers will be vital to create a positive environment in shipping

Author's answer in Technology

Author has no answer to resolve the above issues completely and none have. The identified problems are many and solutions can only evolve with time and as dictated by the rules of economics. But a small and sustainable revolution is possible that can "trigger" or act as a "change agent" against the goliath of growth and chaos that the maritime industry is today.

The author's answer is in application of technology: yes, prudent, step-by-step progress in moving from purely classroom based education and training to a mixture of e-learning and guided tutorials; it is in the application of broadband technology and internet based education, closely geared and cultivated in

collaboration with the MET schools and the industry. It must be with the approach and vision in mind where “technology” must be made available to help in our “work”, be it in a school or in a shipping company office. Wherever we are in short supply of quality teachers and have an inadequate teaching curriculum, we can use the help of such a “networked platform” that can come to the rescue, not only in curriculum delivery, but also in creating a “support mechanism” that students can fall back on when at home or at work.

Thus, the author’s suggestion will work in reducing the number of MET teachers needed and help in providing an open, “for all to see” quality curriculum that can be readily updated and enriched with input from the industry and the academia. The student using the platform can learn from the e-Coach, from fellow students or from anyone including the “experts” who may be connected within the network.

The same solution is also applicable to the shore-based maritime industry, whose individual goals and objectives can be easily met using such dedicated network. This can also act as a “knowledge platform” that will uphold and progress the vision of a learning organization.

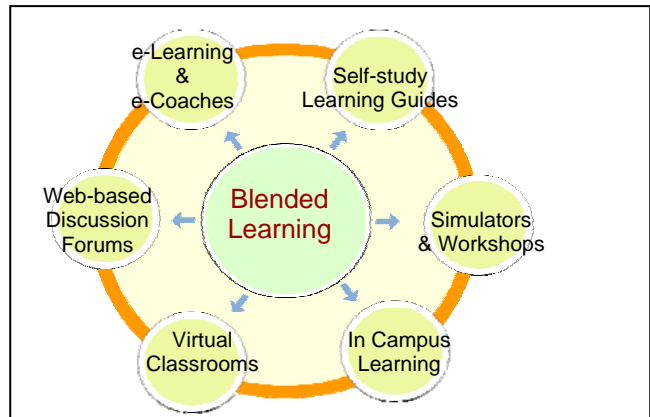
Technology Application in MET

Economically advanced nations with maritime interests will continue to maintain their current MET infrastructure and could benefit from “globalization” or off-shoring some of their activities to train foreign students. The application of ICT will benefit them the most and also the tier 1 countries (Annex 1), which are currently overtaxed in carrying the world’s maritime manpower load and thus failing to maintain quality of the educational outcome. The nations who are relatively new in this business may not want to “re-invent the wheel” and start with experience gained from the traditionally established MET organizations.

Technology application is a “must” for all, but in different degrees of dosage. That is where the technology management becomes essential within the higher echelons of the training management and leadership.

In all businesses today, the application of software solutions in the form of an Enterprise Resource Planning systems (ERPs) that integrate (or attempt to integrate) all data and processes of an organization into a unified system is becoming common. However, for MET and generally for the education business this is a relatively new thinking. The advantage will be in cost saving, better efficiency, less mistakes and very little chance of missing student and staff records. The major task of MET delivery and assessment could also become part of such a solution. This refers to using a good administrative and education management software system or what is referred to as an enterprise version of a Learning Management System (LMS); one such, developed by the author’s company, is known as “Lighthouse” and can effectively make a school operation paperless, or nearly so.

This teaching philosophy blends itself well with e-learning and a well structured Learning Management System (LMS) that can deliver networked learning. In its best use, it can reduce the EOM (expenditure on manpower), in the author’s opinion, as much as 25-30%, after absorbing the cost of the software development and hosting. It also ushers a new way of education and can be referred to as “blended learning” using a networked community of stakeholders.



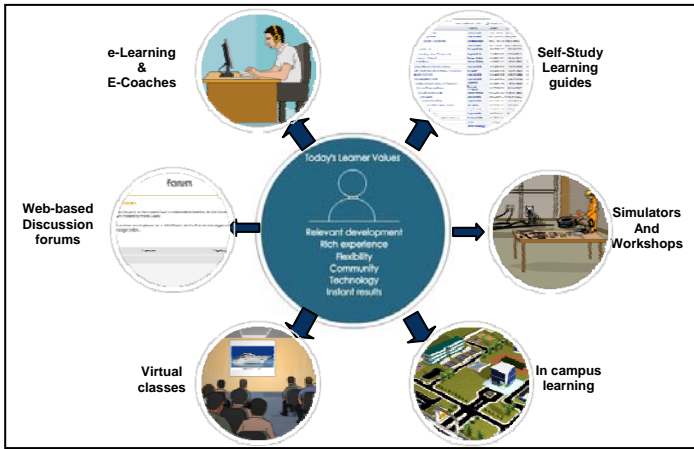
MET schools must have a corporate level strategy and a budget for implementation of ICT technology. In most cases, there are legacy software and processes that cause schools to get stuck in their track: here, while technology could dynamically change the processes, it falters on the lack of technology leadership and capability in motivating people to accept the change process. Schools will have to take a “Top Down” approach and that must create an enabling environment where “change” is welcome in sustaining growth and the reverse is unacceptable.

Sharing our e-learning strategy and experience

There are challenges with respect to the training curriculum, availability of professional trainers and high investment costs in traditional MET. In addition, the problem of attracting young high school graduates into sea will remain a global challenge.

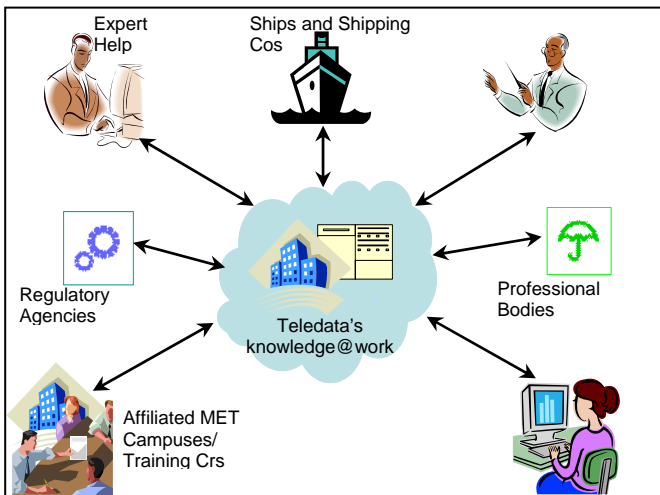
Recognizing this, we tried to understand the learning needs and expectations of today’s students; we wanted to address the generational needs and influence of technology that are part of today’s reality. We realized that today’s training needs must cater to an on-demand world and must be tailored to multiple schedules and learning styles and yet be interesting and fun. We were thrilled to find solutions recommended by IBM in setting up the School of Future (SoF) in the U.S. where they propose to use a variety of learning resources including:

- Self-study learning guides
- Web-based training
- Web-based discussion forums
- Online workshops
- Mobile wireless courseware
- Face-to-face workshops



And, the cornerstones of our “knowledge at work” strategy became developing interesting e-learning solutions and delivering them using a training management platform that is easy to use.

We gathered the best leadership in MET, in e-learning, in IT and gradually built our knowledge center comprising close to 100 people across the globe. In our offshore development center at Chennai on a single floor we have ship captains, chief engineers, ship superintendents, finance managers, maritime teachers and a wealth of resources like graphics and instructional designers, programmers, technical writers, artists, working together: we regularly conduct in-house e-learning workshops by experts in the field. And, gradually, over a period of time, we built the best combination of “knowledge workforce” under one umbrella that can be mobilized to benefit and trigger dynamic changes in the way training is done today by the MET institutions and the maritime corporate offices worldwide.



At some point we were even tempted to create our own “neo-MET” physical campus. But we felt that the massive capital layout and long wait for returns may sap our energy and attention from our “knowledge at work” philosophy in bringing about a quick and necessary change in the maritime training

industry. We realized we can do this better by building our own strength in ICT, education and e-learning capability.

We also recognized that the task was massive and in spite of our commitment and investment in resources we still needed collaboration and partnership with industry and institutions.

We tried to attract the attention and support of the maritime industry by collaborating with Det Norske Veritas (DNV), Norway and created a suite of Ship Superintendent Programs, following the DNV standard. In this effort, we received expert support from the Anglo-Eastern Ship Management, Hong Kong and the major sponsor of these programs today are Maersk Line, USA, the AESM group and a few other shipping companies. It is a massive collection of 33 courses and took us more than 2 years to create and complete. Every page (or, correctly the SCOs: sharable content objects) in these courses are scrutinized by DNV and certified by them, in meeting the DNV standard.

We are in the process of elevating these courses into a Master of Science Degree program in Maritime Management. This is our recommendation to every ship manager as a form of “continuing education” and personal development.

One other recent collaboration with the industry has been with the Breakbulk Institution, USA that was formed by the Commonwealth Business Media’s Journal of Commerce (JoC) magazine. The JoC has been publishing the Breakbulk magazine and also organizing the Breakbulk Conferences globally in locations within the US and in Europe. The stakeholders in Breakbulk shipping have wanted JoC to create a training platform and professional courses that will attract people to join the Breakbulk industry and make that their career choice. That is when the JoC requested Teledata to join forces. The Breakbulk Institute took shape and a decision to develop the “Breakbulk Fundamentals” e-learning course was made. This course was launched during the recent Breakbulk Conference at New Orleans, using the Lighthouse LMS of Teledata. In this example, we dispatched 2 of our shipping and e-learning experts to Houston. They sat with the Breakbulk institute’s advisory board for a number of days to create the course curriculum and come up with a course design prototype. Then the course was developed bit by bit and hosted on a test server of Teledata so that the advisory board members could look at the progress and audit the development. It took us a little more than 6 months to complete this project.

The author mentioned these two examples of active collaboration with the industry in coming up with something that is fresh, not in the books and connected to real-life industry practices. The students in all these programs can study on their own, monitored by experienced e-Coaches on line and can practice their assessment tests at their own will before coming to take their final proctored test for certification. Would this be a success? The author certainly thinks so; since it was created from scratch and based on input received from all the stakeholders in the industry.

We have started on this corporate e-learning path and will be encouraged if the shipping industry will come forward and help us create a whole array of professional courses that will be useful for all knowledge workers within the maritime industry: working in ports, terminals, shipping companies or in any other related auxiliary services. With little investment we can create long term training solutions that can help the corporations achieve their business goals and effectively reduce their training budgets.

In the meantime, we also got seriously engaged in developing e-learning courses in the competency certification/licensing preparatory programs for the Deck and the Marine Engineering officers at the STCW: operations and management levels. Our collaboration extended from Singapore to the United Kingdom, and then, to Malaysia, Europe and the USA. From competency certification, specialist courses like LNG and to Master Degree became the scope of our collaboration.

Here, our strategy was to link up with prominent MET schools and create courses that are identified as needed and with a commercial future. Many of these courses are now complete or on the works, but today we are proud to be associated with the best within the MET industry and thus a credible and responsible provider of quality MET.

With all these, we have learnt to improve and become more efficient in e-learning production and our library of multimedia is now rich. We have worked hard and will continue to do so until we have succeeded in creating a network of well-meaning MET providers, and industry partners and in achieving a unifying quality standard in MET that can be made available to all, with an internet access. The courses will be up-to-date and open to all to critique, enjoy and facilitate knowledge sharing and networking. I am certain this effort will also be helpful to schools that cannot afford to hire full-time faculties and/or, provide back up support to classroom teaching.

Finally, the world-wide pool of available trainers and developers under our umbrella can be of great assistance to the corporate as well as the MET institutions in quickly getting on to a new path where technology handholding is possible, non-threatening and rewarding.

Conclusion

Author welcomes the MET schools and the maritime industry to join and support this technology application in training, making the “knowledge at work” initiative a success, and in partnering a progress that is destined to happen. END.

GDP % SPENT ON EDUCATION AND RANKING FOR MET INVESTMENT

| Countries | GDP Year 20 | Public Expenditure on Education as % GDP | Ranking (1,2,3, No) | Countries | GDP Year 20 | Public Expenditure on Education as % GDP | Ranking (1,2,3, No) |
|----------------|-------------|--|---------------------|---------------|-------------|--|---------------------|
| Gambia, The | 415 | 1.9 | No | New Zealand | 98,944 | 6.7 | No |
| Burundi | 657 | 5.2 | No | Hungary | 100,685 | 5.5 | 3 |
| Lao PDR | 2,452 | 2.3 | No | UAE | 104,204 | 1.6 | 3 |
| Congo, Rep. | 4,343 | 3.2 | No | Singapore | 106,818 | 4.1 | 3 |
| Nicaragua | 4,555 | 3.1 | No | Czech Rep | 107,015 | 4.4 | 3 |
| Cambodia | 4,884 | 2 | No | Malaysia | 118,318 | 8.1 | 3 |
| Zambia | 5,402 | 2.8 | No | Argentina | 153,014 | 4 | 3 |
| Namibia | 5,712 | 7.2 | No | Thailand | 161,688 | 4.2 | 2 |
| Nepal | 6,707 | 3.4 | No | Hong Kong | 163,005 | 4.7 | 3 |
| Senegal | 7,775 | 4 | No | Iran | 163445 | 4.8 | 3 |
| Bolivia | 8,773 | 6.4 | No | Portugal | 167716 | 5.8 | 3 |
| Jamaica | 8,865 | 5.3 | No | Ireland | 181623 | 4.3 | 3 |
| Estonia | 11239 | 5.7 | No | Finland | 185,923 | 6.4 | No |
| Uruguay | 13,215 | 2.6 | No | Greece | 205,215 | 4 | 3 |
| Latvia | 13,571 | 5.8 | 3 | South Africa | 212,777 | 5.4 | 1 |
| Panama | 13,733 | 3.9 | 3 | Denmark | 241,437 | 8.5 | No |
| El Salvador | 15,824 | 2.8 | No | Poland | 242,293 | 5.6 | 2 |
| Kenya | 16,088 | 7 | 2 | Norway | 250,052 | 7.6 | No |
| Costa Rica | 18,496 | 4.9 | No | Indonesia | 257,641 | 1.1 | No |
| Dom. Republic | 18,673 | 1.1 | No | Austria | 292328 | 5.7 | No |
| Lebanon | 21,768 | 2.6 | No | Turkey | 302,786 | 3.6 | 3 |
| Lithuania | 22,263 | 5.9 | 2 | Sweden | 346,412 | 7.7 | No |
| Belarus | 22,889 | 5.8 | 2 | Belgium | 352,312 | 6.3 | 3 |
| Bulgaria | 24,131 | 3.6 | No | Switzerland | 357542 | 5.8 | No |
| Oman | 24,284 | 4.6 | 2 | Netherlands | 578,979 | 5.1 | 3 |
| Slovenia | 32,182 | 6 | 2 | Russian Fed | 581,447 | 3.8 | 2 |
| Croatia | 34,311 | 4.5 | 2 | Brazil | 603,973 | 4.62 | 2 |
| Slov. Republic | 41,094 | 4.3 | 2 | Australia | 637,327 | 4.9 | 3 |
| Vietnam | 45,210 | 4.4 | 2 | Mexico | 676,497 | 5.3 | 2 |
| Morocco | 50,031 | 6.3 | 3 | Korea, Rep. | 679,674 | 4.2 | 3 |
| Kuwait | 55,718 | 8.2 | 3 | India | 691,163 | 4.2 | 1 |
| Bangladesh | 56,585 | 2.2 | No | Spain | 1,039,927 | 4.5 | 2 |
| Ukraine | 64,828 | 4.6 | 2 | Italy | 1,677,834 | 4.7 | 2 |
| Peru | 68,637 | 3 | No | China | 1,931,710 | 5.3 | 1 |
| Romania | 73,167 | 3.5 | No | France | 2,046,646 | 5.6 | 3 |
| Philippines | 84,567 | 3.2 | 1 | U.K. | 2,124,385 | 5.3 | 3 |
| Chile | 94,105 | 4.1 | 2 | Germany | 2,740,551 | 4.8 | 3 |
| Pakistan | 96,115 | 2 | 3 | Japan | 4,622,771 | 3.6 | 3 |
| Colombia | 97,718 | 4.9 | 3 | United States | 11,711,834 | 5.7 | 3 |

Source: <http://devdata.worldbank.org>

Category A

| Member Organization | Country |
|---|--------------|
| Australian Maritime College | Australia |
| Western Australian Maritime Training Centre | Australia |
| Fisheries & Marine Institute | Canada |
| Centro de Instruccion y Capacitacion Maritima | Chile |
| Dalian Maritime University | China |
| Qingdao Ocean Shipping Mariners College | China |
| Shanghai Maritime University | China |
| The Hong Kong Polytechnic University | China |
| Wuhan University of Technology | China |
| Academy of Maritime Education and Training | India |
| Lal Bahadur Shastri College | India |
| Ocean Education and Research Centre Pvt Ltd | India |
| RL Institute of Nautical Sciences | India |
| Tolani Maritime Institute | India |
| Vels Academy of Maritime Studies | India |
| National Maritime College of Ireland | Ireland |
| Tokyo University of Marine Science & Tech | Japan |
| Malaysian Maritime Academy | Malaysia |
| The Maritime Institute 'Willem Barentsz' | Netherlands |
| New Zealand Maritime School | New Zealand |
| John B Lacson Foundation Inc | Phillippines |
| Magsaysay Institute of Shipping | Phillippines |
| Maritime Academy of Asia and the Pacific | Phillippines |
| University of Cebu | Phillippines |
| Maritime State University | Russia |
| Singapore Maritime Academy | Singapore |
| University of Moratuwa | Sri Lanka |
| California Maritime Academy | USA |
| Texas A&M University At Galveston | USA |
| Vietnam Maritime University | Vietnam |

Category B

| Member Organization | Country |
|---|--------------|
| Magsaysay Training Center | Phillippines |
| Colombo Intl Nautical & Engineering College | Sri Lanka |
| Hunter Institute - TAFE | Australia |
| Seafood & Maritime Industries Training Ltd | Australia |
| Antwerp Maritime Academy | Belgium |
| Bulgarian Maritime Training Centre | Bulgaria |
| BCIT Marine Campus | Canada |
| Guangzhou Maritime College | China |
| Maritime Services Training Institute | China |
| Maritime Training Centre - "ANRI" | Georgia |
| QMS Maritime Training Centre | Greece |
| Anglo-Eastern Maritime Training Centre | India |
| Applied Research International Pvt. Ltd | India |
| Commander Ali's Academy of Merchant Navy | India |
| Don Bosco Maritime Academy | India |
| Eurasia Centre for Advanced Learning (ECAL) | India |
| Fosma Maritime Institute and Research Org | India |
| Hindustan Institute of Maritime Training | India |
| International Maritime Institute | India |
| International Maritime Training Centre | India |
| Maharashtra Academy of Naval Edu and Training | India |
| Massa Maritime Academy | India |
| Pentagon Maritime Training and Research Institute | India |
| Shipping Corporation of India Maritime Trg Inst | India |
| Sir Mohamed Yusuf Seamen Welfare Foundation | India |
| Wallem ShipManagement (India) Pvt Ltd | India |
| National Institute for Sea Training I A | Japan |
| Centre for Maritime Studies | Maldives |
| PNG Maritime College | PNG |
| IDESS Maritime Centre (Subic) Inc | Phillippines |
| National Maritime Polytechnic | Phillippines |
| Norwegian Training Centre - Manila | Phillippines |
| Phillippine Center for Adv Maritime Simulation | Phillippines |
| Primorsk Maritime Educational Training Centre | Russia |
| STET Maritime Education Pte Ltd | Singapore |
| The Maritime Centre | Trinidad |
| Tuvalu Maritime Training Institute | Tuvalu |
| Azimuth Marine Ltd | UK |
| Lloyd's Maritime Academy | UK |
| Ho Chi Minh City University of Transport | Vietnam |
| Nantong Shipping College | China |

Category C

| Member Organization | Country |
|--|--------------|
| ISF Maritime Services Pvt Ltd | India |
| Wavelink Maritime International Pte Ltd | Singapore |
| South African Maritime Training Academy | South Africa |
| Mercantile Seamen Training Institute | Sri Lanka |
| Asia Pacific Maritime Institute (APMI) Pty Ltd | Australia |
| MAS Maritime Academy | Bangladesh |
| SafeSpeak ILC, Inc | Canada |
| Zhejiang International Maritime College | China |
| NewsLink Services Ltd | Cyprus |
| Yak Education Trust | India |
| Uniteam Marine Training Center | Myanmar |
| VSTEP BV | Netherlands |
| AustralAsian Maritime Education Services Ltd | New Zealand |
| Seagull AS | Norway |
| Maritime Training Institute | Pakistan |
| PNG Ports Corporation | PNG |
| Far East Maritime Foundation Inc | Phillippines |
| Mariners' Polytechnic Training Centre | Phillippines |
| Maritime Technological and Allied Services Inc | Phillippines |
| NYK-FIL Maritime E-Training Inc (NETI) | Phillippines |
| NYK-TDG Maritime Academy | Phillippines |
| PNTC Colleges | Phillippines |
| DNV Technological Centre | Singapore |
| V Ships (Asia) Pte,Ltd | Singapore |
| Videotel | UK |
| Teledata Marine Systems LLC | USA |

Annex 2

CATEGORIES OF SCHOOLS WITHIN GLOBALMET

- A = providing full service (diplomas, degrees, certificates)
- B = providing partial vocational service
- C = providing marginal and specialist services and may be poorly resourced.