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Maritime Education & Training in India: Challenges Ahead

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Abstract:

[India continues to be a major source for supply of seafarers to global shipping industry. Technological and regulatory changes that the shipping industry has been experiencing over the last couple of decades have impacted significantly on Maritime Education and Training (MET). During the same period, MET in India was opened up to private sector participation. Unprecedentedly large number of institutes seeking to maximise profits and at the same time, cater exclusively to a cyclical industry, resulted in dynamic imbalance between the supply and the demand. This is akin to the 'Bull Whip Effect' that models the unstable inventory levels in Supply Chain Management. This paper argues it is not possible to regulate the supply side externally and calls for self-regulation. Industry participation, information sharing and elimination of middlemen will improve the response of supply side of human resources at the pre-sea level. Following a review of maritime education in India, the paper suggests that higher education needs to focus solely on post-graduate level and industry-led research. This approach, together with appropriate affiliations within and outside the country will help India's nascent maritime educational institutions to present seafarers as well as non-seafarers with opportunities for career growth and expedite global recognition].

Keywords: Maritime Education Training, pre-sea, STCW, MLC

1. Introduction

India is known globally as a major source for seafarers as well as shore-based personnel for the maritime sector. With the opening up of pre-sea training to private participation nearly twenty years ago, a number of institutes came into existence across the country. Today, India produces nearly 5,000 potential seafarers – officers and crew – every year. Finding employment for them in a notoriously cyclical industry amidst stiff competition is a big challenge.

Despite its traditional conservatism, the shipping industry has undergone a sea change over the past two decades. The key drivers of change have been Information Technology, Communications, Ship-shore connectivity and Satellite-navigation. During the same period, STCW came into full force – along with a series of new regulations. Consequently, the expectations of employers have changed significantly. Greater demands are placed on today's seafarers in terms of competencies, technologies and regulations. Added to the list are concerns about terrorism and piracy. Cumulatively, these demands and concerns impact upon contents and quality of education and training at all levels on an unprecedented scale.

According to a study by BIMCO-ISF Manpower 2010 Update, the average sea-going tenure of Indian officers is around fifteen years. Soon after they sail on two or three ships as a Master or a Chief Engineer, most of them chose to quit sailing and seek employment ashore. They are lost to the shipping industry just when they have attained the highest professional qualifications (Glen, D., 2007). They then become job seekers in a wide variety of industries and institutions for occupations for which they have not been oriented. They are called upon to function in work environments that are totally different from what they experienced onboard ships and at the same time, settle for much lower wages. This transition can therefore be highly demanding and stressful. This is an area where specialist education, training and counselling can contribute to vastly improve their readiness for a variety of shore jobs.

This paper addresses the questions: How are we doing in respect of maritime education and training and what are the areas for improvement in pre-sea training and in maritime education as a whole? For the purpose of this paper, training is considered as a means of improving on-job performance in a given role and education as an in-depth understanding of specific fields of knowledge which may not necessarily be linked directly to a particular job function.

2. Pre-sea Training

The yardstick for measuring the suitability of cadets passing out of pre-sea institutes is their employability. Subject to the prevailing requirements of the shipping industry, placement levels and repeat selections made in the campus offer a good measure of an institute's success or otherwise. Going by the statistics reported in the public domain by the office of the Directorate General of

Shipping (DGS; i.e., the Indian Maritime Administration), the percentage of placements has been consistently high in case of two categories of pre-sea institutes:

- a) Pioneering institutions of repute established long ago, with government initiative, namely, Marine Engineering Research Institute (MERI; formerly, DMET) and TS *Chanakya*.
- b) Secondly, those pre-sea institutes that have – either been established and managed or supported actively by shipping companies and ship-management companies.

With the exception of a few, all other institutes – which were established to capitalise on the upward cycle of shipping industry with profit-making as the chief objective, lag far behind above two categories. This lag is measureable in terms of intake, quality of training, rating of the institute and finally, and most importantly, placement of the cadets and industry feedback.

These laggard institutes typically focus on maximising intake rather than maximising placements. They tend to justify their short-term, profit-maximisation motive by pointing to the investments they have made in building the infrastructure.

A number of measures have been tried out by the Administration in recent years – to weed out the laggards and reward the leaders – with varying degrees of success.

The newly-introduced Comprehensive Inspection Programme (CIP) regime does away with multiple inspections and rating regimes. It authorises Recognised Organisations (or ROs, which are basically leading Classification Societies) to undertake the initial and annual inspection and rate the institutes – based on an elaborate checklist. Those institutes that are awarded high ratings (A-1 or A-2) are given access to the ‘green channel’ – permitting them to add new courses without having to approach the Administration once again.

CIP is by far the best approach that the Administration came up with in checking sub-standard institutes and rewarding top performers that are committed to quality of training and competency development in line with industry needs. At the same time, it has its limitations. It does not effectively address the process of knowledge or skill transfer while it does well in its checks on infrastructure and other tangible attributes of the institute inspected.

These limitations in inspection regimes such as CIP in monitoring the less tangible attributes of competency with the required levels of granularity – i.e., at the individual level – are understandable. The real measure of competency and therefore employability is obtained when the cadets pass out and join ships. By then it is too late in many cases – especially in the case of sub-standard institutes which typically do not pay much attention to this aspect in any case. They are not motivated to contact the ship owners to find how their products are performing.

As mentioned earlier, sub-standard institutes that have no organic link to the industry largely remains focused on intake rather than the outcome. This is one of the inherent hazards of supply-side management rather than demand-led production. The “push” of supply into the labour markets (of prospective seafarers in this case) tends to distort the picture – especially when the demand “pull” (i.e., requirements of shipping industry) is neither clear nor stable.

3. The Bullwhip Effect

The cyclic nature of shipping industry is a fact of life that all stakeholders have to live with. Since demand for goods and services relating to shipping cannot be predicted, the best that anyone can hope to do is to regulate the supply side. Same applies to pre-sea training as well.

Borrowing a well-established concept called ‘Bullwhip Effect’ (BWE) from the field of Supply Chain Management (SCM), we can hope to get some insight into the perils of regulating the supply side.

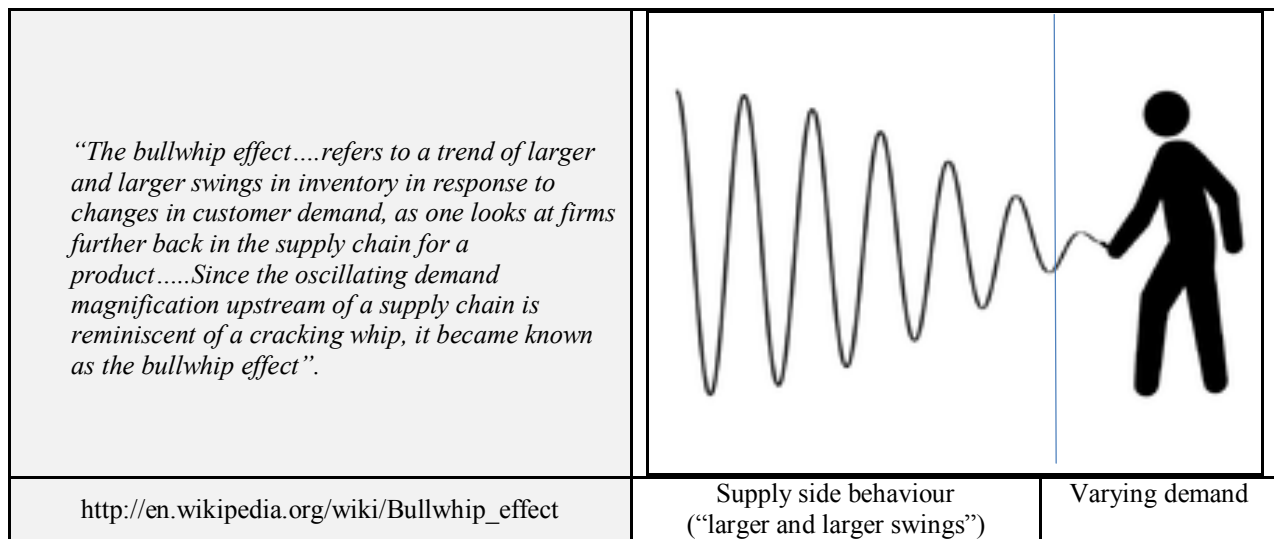


Figure 1

In his paper “Managing Bullwhip Effect: Two Case Studies”, Ravichandran, N. (2006), makes two significant observations:

- BWE is not an external phenomena, but an internal (firm level) response to external phenomena.

- It manifests when supply chain partners operate in isolation and optimise their individual objective function. There is no coordination between them.

It is therefore evident that “larger and larger swings” that occur on the supply side in response to changes in demand are driven by human as well as organisational factors. In the context of pre-sea maritime training, there exist a number of such factors that not only drive the swings, but also introduce biases of their own as elaborated here:

1. *High capital cost* involved in establishing pre-sea training facilities. As in any business, investors and promoters are eager to recover costs and generate profits as quickly as possible. They do this by focusing on intake, engaging middlemen to fill seats and by resorting to aggressive selling by highlighting income levels of seafarers, career prospects, etc.
2. *Constantly seeking expansion* by adding new courses and by increasing the intake capacity of existing courses – even when shipping is not doing too well – is a common feature among several maritime institutes. This makes business sense. Larger batch sizes and added courses enables them to spread the infrastructural cost and profit is maximised through economies of scale.
3. *Engaging agents* or worse still, directing the passing out cadets to unscrupulous middlemen who induce the hapless cadets to pay and get placements. As a result, the trainees not only pay hefty amounts over fairly long periods (usually with parents taking loans from banks) during training, they also end up paying agents to get jobs in dubious companies operating substandard ships.
4. *Distorting facts* by simply fudging the placement records – in order to achieve higher ratings and to impress gullible parents during admissions. The Administration is not in a position to crosscheck the claims when it comes to placements on non-Indian vessels.

At the other end of the spectrum, pre-sea institute owned or managed by ship owning or management companies tend to treat the establishment as a cost centre rather than a profit centre. They aim for long-term self-sufficiency in human resources rather than short-term profit-maximisation from fees. Since they are the end-users of the ‘product’, they also focus on the process of training. Very often, they customise the training to suit their ship types and operational practices and preferences.

With a large number of institutes in the fray as compared to the pre-privatisation era and with multiple layers of middlemen at the intake as well as placement ends of a fairly long process, all the interested parties tend to exaggerate the upward cycles in shipping and downplay the downward trends. As a result, the picture gets murkier. To summarise, we are faced with uncertainty of demand, unstable supply, three to four year-long lead-time (between admissions and passing out) during which, the demand profile might change completely and a large number of institutes and agents competing fiercely in a volatile market. The end result is that managing the supply side has become a herculean task for the Administration.

4. The Way Forward: Pre-sea Maritime Training

Going back to the BWE model, here are a few suggestions that might help to deal with the “larger and larger swings” as well as the biases that are introduced by the interested parties:

- a) *Improve the information flow*: To a large extent, this is facilitated by the statistics presented in the website of Directorate General of Shipping (DGS), i.e., the Indian shipping Administration. However, the information presented is always the past data and as such, it is more useful for analysis rather than in current, real-time decision-making.
- b) *Eliminate or regulate the middlemen* in admissions as well as placement phases. Each self-promoting layer tends to exaggerate the available or non-existent opportunities to maximise their profits, thereby amplifying the swings, adding a bias to suit themselves. Eventually, it is the cadets and their parents who are made to pay for this greed and obfuscation. In recent times, the Indian Administration has come up with measures to issue licenses to placement agents and make them accountable.
- c) *Minimise the lead-time*. Limit those pre-sea institutes where there is no direct involvement by shipping industry to short-term courses – such as Graduate Marine Engineering (GME).
 - i. *Engineering*: As far as engineering courses are concerned, institutes that do not have direct links or stakes with shipping industry or poor placement records are to limit themselves to training of graduate and diploma engineers. This will bring the course lead time closer to the demand fluctuation – as compared to a 4-year marine engineering course. Also, trainees who already have degree or diploma in engineering will have means of seeking employment in industries other than shipping – if the situation demands.
 - ii. *Navigation*: With regard to navigation courses, placement onboard as a part of their training (not just final employment) has become a big challenge with middlemen taking the desperate cadets for a ride. Here too, such courses are to be confined to institutes with direct participation by shipping companies where their onboard training is assured up front.
- d) *Industry participation*: It follows from above argument that i) 4-year engineering and ii) navigation courses requiring sea time are to be open only to those institutes that are owned or managed by shipping or ship management companies.
- e) *Limit the batch sizes*: Notwithstanding the all-round clamour from the institutes that are stand-alone commercial enterprises for increasing the number of seats per batch whenever shipping is going through an upward cycle, the Administration needs to take a firm stand. As mentioned, it will be more prudent to be driven by the demand “pull” rather than supply “push”. If and when the demand rises dramatically, shipping companies always have the option of imparting onboard training to their own cadets. In this context, it is heartening to note that there is at least one institute in India that actually regulates the batch size (in consultation with the partnering shipping companies) on its own so as to ensure 100% placement.
- f) *Opportunities in offshore*: The offshore sector as well as other industries engaged in sub-sea operations do offer alternative employment opportunities to the cadets passing out from pre-sea training institutes. However, further orientation and training are needed to facilitate the cadets to take this route. It may be mentioned here that the National Seafarers Union of India (NUSI) has

recently taken a commendable initiative in this direction by establishing state-of-the-art NUSI Offshore Training Institute (NOTI) near Mumbai. Its acceptance by the industry and employment opportunities that it can generate are yet to become evident.

5. Maritime Education

Maritime education is fundamentally different from pre-sea and post-sea training – as the following table illustrates:

Attributes	Pre-sea Training	Maritime Education
Trainees	Aspiring seafarers	Ex-seafarers and non-seafarers
Focus Areas	Skill development, engineering education and graduation	Specialist qualification in technical or managerial domains
Intake	National	International
Standards	STCW	None for certificate courses. Standards of UGC (in India) or globally accepted, industry-valued bodies become applicable for Diploma and PG degrees
Pedagogy	Classroom teaching, workshop practice. Simulators	Classroom teaching, e-learning, blended learning, seminars, workshops, case studies
Accreditations	Administration, AICTE	Options open to collaborate with universities in India and abroad
Qualifications attained	STCW-defined	Certificates, Diplomas and Post-grad Degrees
Career choices	Shipboard functions	Wide-ranging, shore-based, across different maritime segments
Vulnerability to business cycles	High since career options are focused solely on shipboard employment	Relatively low since several options exist across maritime segments

Maritime education is closely aligned to research and development (R&D), academia-industry collaboration, affiliation with national and international institutions and the resulting global standing. Whether engaged in delivery of short courses or promoting post-graduate and doctoral studies, maritime education deals in two chief sectors of content focus: a) Marine, offshore and subsea technologies and b) Industry-specific management studies.

Being an institution established by IMO, the World Maritime University (WMU) focuses primarily on management courses and aims at effective implementation of IMO Conventions by national Administrations and other governmental bodies and organisations from across the world in general and from developing countries in particular.

Universities of Newcastle and Strathclyde and Australian Maritime University on the other hand, are renowned for strong engineering programmes that are backed by dedicated research projects.

While training is actively sponsored, supported or nurtured by shipping companies in many cases, with global minimum standards as specified by STCW and regulated by national Administrations, maritime education is mostly an individual pursuit – sponsored at times, by industry. In order to discuss questions relating to maritime education – unlike in the case of training – it is essential to look beyond Indian shores both in terms of global affiliations as well as admission of international students.

With the establishment of the Indian Maritime University (IMU) nearly six years ago, expectations ran high and many thought that opportunities for higher education maritime sector have finally opened up in India for seafarers and all others who might be interested in furthering their careers in the maritime sector. In its initial years, IMU found itself at the receiving end of some really bad publicity. Also, because of the route in which it was established i.e., by taking over existing pre-sea institutions while its focus is ought to have been on R&D and post-graduate studies, IMU ended up riding two different boats at the same time. On a positive note, IMU is the only university in India which recognises STCW qualifications as equivalent to graduation and acceptable for entry into its post-graduate courses.

It is heartening to note that a number of institutes across India have been offering short post-sea courses that are industry focused and go well beyond the requirement of STCW-driven competencies. Some of them do have the potential to move into maritime education domain. It is worth noting here that a private maritime university namely – Academy of Maritime Education & Training (AMET), Chennai – became fully operational. Today, AMET not only has built affiliations with renowned international institutions and universities such as (Universities of Strathclyde and Plymouth – for example), it has also been attracting large number of students from other countries. Plans are afoot for establishing some more maritime universities – by state governments or by private parties.

Even at present, there exist a number of institutions abroad and more recently, in India that offer courses in maritime education. They fall under four categories:

- 1) Institutions or academies owned/managed by leading Classification Societies;
- 2) Leading international institutions and universities that offer some of these courses with their focus varying from
 - a) strong technical content meant for practising engineers to
 - b) management courses that address shipping or (offshore/onshore) oil & gas business;
- 3) Indian institutions/universities that offer courses on similar lines as above (2); and
- 4) Companies that started out as content developers (videos, CBTs, simulators, e-learning modules, etc.) and then moved into MET.

The following table presents an overview of these four types of institutions:

	Type of MET Institution	Examples
1)	Academies of Class Societies	Lloyds' Maritime Academy (LMA), DNV-GL Academy, ABS Academy, more recently, IRClass Academy
2)	International Institutions/ Universities	Newcastle, Strathclyde, Australian Maritime College, WMU, Glasgow
3)	Indian Institutions/ Universities	IIT (Kharagpur/Chennai), AMET, Cochin University, IMU, University of Petroleum & Energy Studies (Dehradun), Narottam Morarjee Inst. of Shipping
4)	MET content providers and developers of CBTs, simulators, etc., moving into education	Videotel (UK), Seagull (Norway), ARI (India), Teledata Marine Solutions (India)

Table 1

6. The Way Forward: Maritime Education

Key success factors in maritime education are:

- Knowledge base* derived from qualifications and experience of the faculty members and R&D base of the institution – both of which will determine the quality and depth of the course contents;
- Delivery systems* including infrastructure and increasingly, ability to deliver distance learning courses through e-learning with a global reach using an effective Learning Management System (LMS); and
- Reputation* in terms of value-addition as perceived by industry and individual aspirants, together with global ranking – that has built through consistent quality, effective affiliations with other institutions, exchange programmes for students as well as faculty, international accreditations, etc. Eventually, the students as well as industry should perceive significant value-addition.

It may be argued that reputation cannot be built overnight but it is possible to collaborate with and get accreditations from well-established and reputed institutions in India and abroad. But clarity of vision needs to be in place to begin with. In order to build a strong base for maritime education in India and kick-start the venture, some of the initial measures would be to:

- Move away from pre-sea training and remain focussed on post-graduate courses that are valued by industry as well as individuals.
- Build strong collaborative research and development initiatives with the support and participation of maritime sector. This needs to become the unique feature of maritime education and the starting point for ongoing partnerships. Industry is to be roped in to provide scholarships and support specific academic chairs.
- Network with well-established Indian institutions (such as the IITs and NITs) to gain strength in technical and engineering courses without having to re-invent the wheel or duplicate facilities. Same applies to managerial courses since excellent management schools already exist in India.
- Collaborate with renowned universities and institutions from abroad to obtain accreditations and also develop exchange programmes and execute R&D projects jointly.
- Leverage India's reputation to build course delivery around state-of-the-art technologies in content development, e-learning and learning management.

Above measures, when implemented, will address the three key success factors listed earlier: Knowledge base, delivery systems and reputation through value addition.

7. Conclusion

7.1. Pre-sea Training

- Managing the supply side of seafaring talent for meeting the demands of an industry which is inherently cyclical is fraught with pitfalls. This has become an even bigger challenge when a large number of pre-training institutes came into existence over the past two decades through private sector participation.
- As demand for seafaring personnel varies, the supply side undergoes large fluctuations akin to the Bull Whip Effect (BWE) – a well-established concept in Supply Chain Management. Further to these erratic fluctuations, biases are superimposed on the supply functions with multiple layers representing interested parties and agents (at the intake and placement ends) trying to optimise their returns, complicating the situation further.
- Attempts that remain focused on the supply side (in this case, supply of seafarers to labour markets) and do not effectively link supply to the demand side are bound to fail. At best, they remain inadequate.
- While measure undertaken by the Indian Maritime Administration (DGS) have succeeded to certain extent in rewarding high quality pre-sea training institutes and in weeding out substandard ones have produced positive results, they do not adequately capture or address the pedagogic issues and most importantly, the industry feedback continues to be missing.
- Employability of the cadets as perceived by industry is the only yardstick for quality of pre-sea training. As such, industry participation in training process is critical.

- By limiting long-term courses to institutes owned or managed by shipping companies, the fluctuations on the supply side can be addressed and training processes and outcomes can become self-regulated.
- It will be worth-exploring to look into employment opportunities for cadets from pre-sea institutes in sectors other than traditional shipping. Offshore is a good example. Other options could include dredgers, tugs, inland vessels, etc. At the moment, there is reluctance among passing out cadets to pursue such alternatives since they do not count in their sea time.

7.2. Maritime Education

- With a large proportion of Indian seafarers traditionally choosing to seek shore-based employment early on coupled with huge upsurge in numbers at the entry level, specialist maritime education is sure to be sought after in coming years.
- Unlike pre-sea maritime training, maritime education aims at specialist qualifications in technical or managerial streams. The student intake as well as placements need to be international and not just national.
- The pre-requisites for maritime education is a combination of knowledge base, delivery systems and reputation. They have the ability to address the aspirations of sea-farers as well non-seafarers and cater to the needs of a wide range of segments.
- As some players in India have already demonstrated, a number of routes exist for successful building of maritime educational centres within a short period – by leveraging on India's existing strengths and combining them with appropriate international affiliations and accreditations.

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