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Competent Staff Essential to Ensure Competent Seafarers

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1. Introduction

The global shortage of seafarers continues despite events resulting from the economic downturn, such as scrapping of older vessels, cancellation of newbuilding orders, laying up of vessels.

This means that any efforts for retention of seafarers or recruitment of new intake are as essential now, as have ever been in the past.

Numerous efforts have been developed and initiated over the years to attract new generations of youngsters into the industry. A few examples from the Netherlands are highlighted in this paper.

A shortage of seafarers will also result in a shortage of teaching staff. How to attract teachers and what career is available for them is a further essential component to consider in assuring that qualitative MET will be available in the years to come.

In the Netherlands at one time there was a qualifying academic programme for maritime lecturers and instructors. This system was abandoned a number of years ago, due to the reorganization of teaching qualifications and academic programmes. But now the lack of well prepared, trained, educated, MET providers is beginning to become a major concern in the industry. Lower educational standards. outdated educational programmes, more and more short teaching programmes, followed by instant on board promotion and thus lower standards of competence are becoming reality.

In order to offer a proper upgrading programme for MET staff a new, modular online MET staff development programme is being initiated which, when fully completed, will lead to an MSc degree in MET.

2. Seafarer Shortage

The global shortage of seafarers continues to hit the industry, despite actions resulting from the economic downturn, such as scrapping of older vessels, cancellation of new-building

orders, laying up of vessels, slower sailing, utilizing vessels as storage facilities etc. This means that retention of seafarers and recruitment of new intake are as essential now as they have ever been in the past.

Various studies over the recent months have shown the following facts and figures:

- The global officer supply in 2009 is some 517000
- This is an increase of 28% since 1990 and of 11% since 2005
- Nevertheless in 2008, the officer shortage in 2009 was assumed to be 34000
- And recently in 2009 the updated shortage figure is still estimated at 33000
- The forecasted officer shortage in 2013 (with fleet growth 14%) is up to 56000
- And even if the fleet growth is 10% lower, a shortage of 42000 is estimated.

One could ask the question which circumstances have created this seemingly structural shortage phenomena which in fact has existed for many years now? And is there finally a solution to solve the problem?

It is often argued that there is too much wealth in western countries which makes the attractiveness of a seafaring career a lot less. Why bother going to sea if there is no financial need to do so?

Cheap airfares are also a lethal component in the promotion of the attractiveness of a seafaring career. 500 euro takes you halfway around the world, when ever you want, probably including full accommodation in your holiday destination as well!!

Obviously because of the decrease in numbers of seafarers the profession is becoming less well known. In the old days there were four professions for a young man: one could become doctor, farmer, administrator or seafarer. Nowadays a student in Netherlands can choose from some 388 degree programmes in the Universities of Applied Science. It will be difficult to find that single one called seafaring!!

Furthermore there is the continuous stream of mainly negative publicity about seafaring as if journalists are only trained to report on negative news. Polluting accidents, sinking ferries, pirate hijacking,all do not improve the perception the general public has of the shipping industry.

And finally the outdated perception of the profession is heard amongst youngsters, that they do not want to be away from home for 10 – 12 months!! As if this would be the case in any of the structured and reputable ship owner or ship manager routines.

When talking to young people as potential seafarers, the criminalization of the master is mentioned as a not very attractive outlook. This together with the sometimes multi-multi-cultural crew and the overall decreasing esteem of the profession makes it difficult in the western countries, to continue to interest the new generations.

3. Present generation

Whereas much of the abovementioned circumstances are related to western oriented societies, there is no doubt that in maritime developing countries these situations and attitudes will also develop, as the standard of living, in that country, rises.

Many psychologists, sociologists, marketeers , are doing their utmost to identify what the present generation is like and what it is that makes them function, be motivated and perform. There are many reasons for wanting to identify this.

Since the Second World War a distinction as below has been recognized and named

- Babyboomers 1945 – 1960
- Generation X 1965 – 1985
- Generation Einstein 1990 – now
  (also called "more and more generation", "pc screen generation", "image generation","thumb generation","pick and mix generation")

With this present Generation Einstein a new approach is needed to get them involved based on their characteristics and attitudes which can be listed as:

- Fast, clever, sociable
- Society conscious
- Keen on intimacy
- Loyal, functional
- Learning visually, not verbally text based
- Creative and imaginative
- Commercially oriented
- Media smart through 24/7 information society
- Computer as a social machine and part of life
- Continuous contact by internet, MSN, chatten

Drastic and very unconventional measures will prove necessary to attract this generation of youngsters If we are really serious about manning ships with young intelligent new generation persons we will have to offer good working conditions, extreme internet access and a modern relevant and practical educational system.

4. Educational systems

Obviously what the new generations do not like is non-functionality and unnecessary work, procedures, activities. Which brings us to one of the prominent problems in many MET systems. Very often extremely traditional education forms and content are very de-motivating for our young generations.

In the Netherlands we have tried to improve this aspect by incorporating both MoE and MoT exams into one activity, as we were probably one of the rare fields of study where a student was examined twice on the same subjects, but for different authorities. (Because we have always been doing it that way??!!)

Besides that the educational system was transformed form a knowledge based system to a very practical competence based programme. Some characteristics along that path included

- Form mono to dual purpose
- Subjects to modules to competences
- Knowledge based was transformed to competence based
- Examination to assessment
- Diploma to degree incl. Dublin descriptors
- European Credit Transfer System was introduced
- Quality Assurance systems initiated

Assuming we will find enough interested youngsters to take up seafaring and believe in the industry, our worries for the quality of this MET should become apparent.

Seafarer shortage automatically implies teaching staff shortage. And if we can find individuals willing to change from sea to shore, decent employment conditions (read salary) is the least requirement necessary. Once that is solved the teaching capacity of the ex seafarer must be evaluated and where necessary upgraded and updated.

The way this was achieved in the past in Netherlands is described hereafter. However what is a past without a future, so how are we going to meet the needs to come.

Obviously it will be very beneficial similar to any professional education that the teaching staff has some experience in the field he or she is supposed to teach. Apart from a good theoretical background having had the own hands on experiences is important.

5. Staff development

As an established maritime nation the maritime education and training system in The Netherlands has a long history and excellent reputation. This reputation is partly due to the high standards required of the teaching staff.

After the highest professional qualification and ample seatime the prospective MET lecturers seeking the highest level of teaching competence were required to follow a dedicated teacher training programme of five years fulltime compressed into a parttime format.

This programme was unique in it's kind and officially known as the "Vereniging Cornelis Douwes" courses. There were four specializations in the course depending on the entrants background and chosen topics: Navigation, Seamanship, Engineering, Radio Communications. The course resulted in a multiple MSc and provided the assurance of a fixed contract in the then Higher Dutch MET institutes.

However, the efforts required during a five year period, usually aside a teaching job necessary to make a living, hardly generated a great popularity for the programme. The number of students in these teacher training programmes slowly decreased and since some years there are no entrants at all and the system ceased to exist.

6. MET Master

Apart from the seafaring bachelor level staff, many organizations in the maritime field have the need for further educated professionals. Besides that, numerous students both seafaring and maritime shore-based have the potential and ambition to take on further relevant studies.

With this in mind a number of new Master programmes have and are being initiated both by MIWB and in various MIWB collaboration arrangements with other organizations. These consist of tie ups with Dutch and European universities focusing on transport and logistics, nautical and engineering sciences as well as the unique programme of MET Master.

Where there is a global demand for scores of quality seafarers the realization is coming about that without proper MET educators and trainers there are no qualified seafarers. Many shortcuts and adhoc solutions are sought to try to overcome the existing shortage of qualified teachers.

The MET Master course objectives are clearly to enhance the professional expertise of those wishing to pursue a career in the maritime education and training field by offering indepth knowledge and background information on maritime subjects. Furthermore all elements of pedagogics and teaching didactics are offered.

As MET teachers or instructors, a good deal of personal expertise is required to offer a qualitative teaching programme. Therefore one of the entry requirements apart from the academic basic qualifications is the possession of a certain certificate of competence in the nautical and or engineering discipline.

As the maritime business is an international activity and as the maritime language is English is seems obvious that the MET Master programme is conducted in English. This also makes entry by foreign participants from any maritime country an easy route to follow.

The fields of study are various but the programme modules can be divided into

- Supporting modules such as

Applied mechanics, Computer technology, Law

- Primary general module topics such as

International regulations, Management, Teaching pedagogics, Simulation, Marine pollution and prevention

Depending on the background expertise a choice can then be made between the nautical or technical stream covering

- Primary nautical module topics a.o.:

Shipping economics, Cargo and transport, Shiphandling, Naval architecture, Navigation and systems, Communications, Safety and survival, Meteorology and oceanography

- Primary marine engineering module topics such as :

Automation and control systems, Diesel engines, Steam systems, Refrigeration systems, Marine electrical engineering

For those not wishing a career in MET a selection of the professional modules can be chosen and for those not wishing to complete the entire Master programme individual modules can be followed as postgraduate courses during a suitable timeframe.

7. Conclusion

In this way we hope to offer both the right content for individuals and the new ideas for institutions to improve the overall quality of MET and make the MET profession an appreciated career change.
Hopefully this will bring the quality of seafaring and shipping overall to a level that once again is something to be proud of and an enviable and natural choice for the generations to come.
Within the present day situation, where economics seem to be overruling anything and everything, anywhere and everywhere, anytime and every time, it seems important to realize that students and staff are really very essential in both MET and far beyond!!

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Innovation in Maritime Education and Training

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Abstract

The extensive amendments to the STCW Convention agreed in 1995 only came into effect in 2002 with some additional changes in January 2003. The provisions concerning the need for governments to submit quality standard reports to the IMO, concerning their national training and certification systems, were only required to be met as recently as 2004. The paper argues that sufficient time has elapsed to assess the impact of the changes introduced particularly the prime objective of the changes i.e. whether confidence is stored in the validity of seafarers' certificates of competency regardless of the country of issue. The paper further argues that since 1995, there have been rapid changes in the design of ships and the equipment used in the navigation and propulsion systems and yet there has been no serious attempt to revise the STCW and/or the IMO model courses in these connections. The changes introduced in 2003 were not extensive and the expected changes in 2010 while they are expected to address several important issues the paper argues that there remains a number of deficiencies in STCW even if all of the proposed changes are implemented. New regulations and conventions in the majority of cases have been reactive and have each come about after a major disaster at sea. The introduction of some of these new regulations such as ISM and ISPS codes, together with commercial demands, has increased the workload on-board. Considering that certain sectors of the industry have experienced very severe shortages of officers and this together with the continuing growth of the world fleet raises several serious questions for instance, does STCW and the expected changes address the automation problems or identified communications failures and would they address difficulties resulting from manning problems which have often manifested themselves into long working hours and fatigue, which in turn has resulted in several accidents at sea and in ports. Under the above considerations, the paper questions if STCW and the expected changes are sufficient to address the MET requirements and the problems faced by the industry and are these changes in short fit for the purpose. Special references are made to the work of Yongxing (2009) and Ziarati (2010) regarding the expected changes to STCW and their consequences.

This paper gives a background to TUDEV and its contributions to the development of MET programmes and practices and summarises TUDEV's initiatives to harmonise the maritime education and training in Europe and to address the deficiencies of the STCW.

Key Words: STCW, Maritime Education and Training, European Maritime projects

1. Introduction

Shipping is perhaps the most international of the entire world's great industries and some of the most dangerous. Safety of life at sea and the marine environment as well as over 80% of the world's trade depends on the professionalism and competence of seafarers. It has been reported that the over 80% of accident and incidents are due to human error IMO (2005), Ziarati (2006 and 2007) and SOS (2005-2007).

To identify the main problems and their causes and more importantly where these failures occur, it has been vital to look at some relevant and recent papers and reports. One interesting and informative paper is a recent study by Torkel (2004). He reports that 25% of the world fleet was responsible for more than 50% of shipping accidents around the world. The study notes that the top 25% of the safest ships were involved in just 7% of all accidents. The outcome of the study by NYNU (2005) published by the University of Technology and Science (NTNU) in Norway, reports that by improving the quality of the world fleet to the same level as those in the safest 25% category, there might be an overall reduction of 72% in shipping accidents. The paper states human error rather than technical matters are the most common cause of accidents. The study also reports that smaller ship owners have a poorer safety culture and they do not often have the resources to implement STCW or ILO requirements. These smaller companies could benefit from the national and European funding to improve their management and operation of their shipping business.

There are also severe shortages of well qualified seafarers at different levels of seniority (Urkmez, 2005; Pourzanjani et al, 2002; Schroder et al, 2004 and IMO, ibid) and yet there are many young people unemployed in Europe (Ziaraiti, ibid). Since the young people do not find seafaring professions attractive there are arguments (Urkmez, 2005) for increasing the number of non-EU seafarers of different ranks in the European flag countries. There are attempts by major MET partnerships, institutions and organisations such as MarEdu (see for instance www.maredu.co.uk., www.egmdss.com) , Strathclyde University, ARKAS, Lloyd's Register of Shipping, TUDEV (Project ATRACT-ME, SOS, etc), C4FF (Projects SURPASS, M'AIDER – see www.c4ff.co.uk) and so forth to make MET more accessible and/or seafaring more attractive to young people in Europe.

Innovative concepts of marine education, a shift from knowledge-based to a competency-based training, and the need for constant professional updating and recertification have brought maritime training institutions out from under the shadows of the maritime administration and industry; now they must assume an equal partnership rather than simply

reacting to the others' demands. Maritime institutions must implement their programme content efficiently and effectively in accordance with the STCW's requirements and the contents of the IMO Model Courses; they must improve standards of teaching staff, facilities and equipment and proactively support the efforts by the IMO and agencies such as the European Maritime Safety Agency (EMSA) to develop and implement STCW and have a feel for ILO, SOLAS and MARPOL requirements with clear understanding of importance of ISM, ISPS. Simulators used for training or assessing competence are required to comply with provisions contained in Section A-I/12 of the STCW Code, which is especially devoted to the use of simulators. Use of simulators in STCW implementation is relatively recent and MET institutions are becoming proactive in their applications. The Leonardo projects SURPASS (2009-2011) and MAIDER (2009-2011) are two examples of several MET institutions and progressive maritime enterprises forming consortiums to primarily and proactively develop simulator scenarios for inclusions in MET programmes based on accidents and incidents at sea and in ports but also relating to causes of accidents due to the identified gaps in education and training provisions.

2. Review of STCW Convention and Its Codes

The review, which commenced with several minor changes in 2003, reflects the trends in the need for more specialisation to address the higher-level maritime operations onboard through a wider coverage of knowledge and skills and competency required as results of the changes summarised earlier. The development of advanced navigational technologies, specialised and professional transportation technologies and pollution prevention technologies and regulations were considered important for inclusion into the seafarers' competency standards.

2.1 Agreement on STCW Changes

A recent review by Ziarati (2009) of the paper by Yongxing (2009) indicated that the STW Sub-Committee has agreed to:

Retain the structure and goals of the 1995 revision;

Address the inconsistencies, misleading interpretations, outdated provisions, MSC instructions,

Address requirements for effective communication;

Provide for flexibility in terms of compliance and for required levels of training and certification and watch-keeping arrangements due to innovation in technology;

Address special character and circumstances of short sea shipping and offshore industry;

Address the maritime security more effectively by inclusion of specific provisions in the convention;

Not down scale existing standards;
Amend the articles of the Convention.

2.2 Security Training and Related Issues

The IMO is determined to design a more systematic maritime security training scheme. This was agreed with a set of three-level security training and knowledge requirements for the Ship Security Officer, for shipboard personnel having specific security related duties and for all other shipboard personnel. It is stipulated that all shipboard personnel should be subject to the basic skill training and guidance for maritime security as required by the Regulations VI/1 and VII/1 of code A; All shipboard personnel having specific security related duties shall receive professional training related to the Shipboard Security Plan and that when onboard all employed personnel undergo familiarisation training to develop the required security skills. Authors of this paper argue that recently emerging piracy issues should also be seriously dealt with in this context in order to provide more assets for the ship's crew for their own defence. Recent incidents have clearly shown that neither the naval operations nor the legal arrangements were sufficient to prevent piracy attempts which are not only hampering day to day maritime trade but are also making the profession even less attractive to young people.

2.3 Simplifying Navigation Calculations

The competency standards relating to celestial navigation calculations has been reviewed and strengthened. The regulation B –IL/1 of the code will be amended. The application of computerised celestial navigation calculation method will be included in the relevant provision of code B. Use of computers and hand held calculators for celestial navigation calculations may yield substantial reduction for dedicated class hours which may be used for extended simulator practice.

2.4 Adding Training Requirements for VTS

This is primarily included to secure the understanding of the masters, chief officers and officer of watch on the types and the limitation of VTS, and prepare them so that they apply specific procedures for the VTS maritime safety with regard to table A-II/1, A-II/2 and A-II/l of the Convention, and 3-1 of A- VIII/2 and B-I/12 and their expected updates. This can be achieved in short courses on VTS applications designed both for VTS operators and ship officers in a simulator environment. Also including pilot trainees in these courses may provide full training for all involved in entry/departure operations.

2.5 Introducing Electrical-electronic Officers

To respond to the complexity of high voltage electricity, electrical operations, computer operations and electronic devices onboard, the competency standards for electrical and electronic officers will be set up. One important aspect of this issue is to be the clear definition of the job description of these new officers. Are they going to be pure engineers dealing only with the maintenance of the shipboard systems or are they supposed to assume navigational watch responsibilities as well? This will be one of the main issues for developing/updating MET curricula in accordance with STCW amendments. For example if such officers are going to be responsible for all shipboard systems, then a single watch officer both for deck and engineering may become more feasible in the future which eventually will lead to a uniform/line OOW training curriculum.

2.6 Making BRM and ERM Training Compulsory

The courses were developed and encouraged by the shipping industry. Considering the similarities between Bridge Resource Management and Engine-room Resource Management principles the two courses will be transferred from section B- V III /2 to A- VIII/2 and hence made compulsory.

According to Yongxing (2009) the new convention is expected to come into effect in the year 2012 and be applied in the next 8-10 years. It is expected that the new revision will play an important role in improving maritime safety and pollution prevention through its effective implementation world-wide. For MET institutions, Ziarati (2009) states that the revised Convention will require a revision of strategies for teaching, learning and assessment as there will not only be new content but greater and wider use of high technology navigation and hence computer simulations. The simulators will play a major role in learning and competence development and assessment. The need to develop transparent quality assurance and control as well as management becomes more urgent for reputable METs particularly considering the new and more determined role by authorities such as EMSA in externally verifying the implementation of STCW in member countries by visiting MET institutions. The revision of STCW in 2010 is as significant as the changes introduced in 1995 and the implementation of the new STCW will be very challenging for MET institutions and the national administrations. The new STCW is expected to create opportunities for progressive MET institutions to take a lead and offer leadership for development and transfer of innovation world-wide.

3. ILO Maritime Labour Convention 2006

A summary of the ILO Maritime Labour Convention (2006) is given in a recent paper by Yongxing (2009). The Convention provides comprehensive right protection for more than 1.2 million seafarers in the world. The new labour standard consolidates and updates more

than 65 international labour standards related to seafarers adopted over the last 80 years. The Convention sets out seafarers' rights to decent conditions of work on a wide range of subjects, and aims to be applied globally, easily understandable, readily up-datable and uniformly enforceable. It has been designed to become a global instrument known as the "fourth pillar" of the international regulatory regime for quality shipping, complementing the key IMO conventions such as STCW, SOLAS and MARPOL. The Convention is expected to come into effect in 2011 and be fully implemented by 2013.

The new Convention will enable the industry to attract more young people to join the seafaring profession and will provide an opportunity for the MET institutions to attract more high quality students and consequently the quality of MET will be improved. The improved quality could lead to safer seas and ports and allow for further mobility of seafarers (TRAIN 4Cs I and II, 2008 and 2010). However, there is still a need to improve social security related issues for seafarers to attract young people to the profession. This must be dealt together with the revision of the ISM and new safety measures. One important aspect of this issue is the criminalisation of seafarers for the accidents and incidents which was expressed as the top issue by the cadets who participated in the young seafarer's forum. As it is often difficult to find the owners of a vessel, arresting and charging the captain and officers on duty seems an easy way out. But it is often desperately unfair and could hamper the attempts to attract more young people to the profession. So what is the solution? Should the officers of ships be jailed for being on the bridge during an accident? Or are the owners liable? Or those who pay for the clean up – classification societies, insurers, owners? It is believed that both new convention and STCW amendments should bring clear resolutions on these issues.

4. SOLAS, MARPOL and Other Maritime Conventions

Today there are many new topics and issues in maritime safety that require the attention of the IMO and maritime community worldwide such as emergence of automation, importance of reducing pollution and improving safety and security which required a careful review of the LRIT, GB3S, GISIS, FSA and initiatives promoting the assessment of risk management, E-Navigation, and port of refuge regulations.

The protection of the environment has now become a topical issue and recent IMO initiatives with regards to reducing waste and pollution such as 'Ships Recycling, Green-House Gas Emissions from Ships (GHG), Special and Particularly Sensitive Sea Areas, Control and Management of Ship's Ballast Water and Sediments, etc.' will provide ample opportunities and catalysts for MET institutions to review their provisions while at the same time incorporating the changes in STCW requirements.

5. Several Neglected Areas

What is alarming is that sea transportation is growing and with this growth the numbers of accidents, despite having modern technologies, well equipped and seaworthy ships with qualified crew, continue to occur at an undesirable level with unfortunate consequences, which vary from loss of lives, substantial damage to the marine environment and loss of Cargo. Careful study of the accident reports reveals that 80 to 85% of all accidents are either directly initiated by human error or are associated with human error by means of inappropriate human responses to threat situations (SPIRIT, 2007). This is in line with the findings of a recent paper (Ziarati, 2006) that 80% of accidents at sea are caused by human error. This Paper (Ziarati, 2006) notes that mistakes are usually made not only because of faulty, deficient or inadequate regulations, but because some of the regulations and standards that do exist are often ignored. The IMO accident analysis reports (Ziarati, 2006, 2007 and 2009) clearly indicate the causes of many of the accidents at sea are due to deficiencies in the education and training of seafarers or disregard for current standards and regulations.

It is not a criticism of the IMO to say that the IMO is too large and has an immense inertia to be effectively proactive. The majority of conventions and regulations have come about after a major accident. One of the most important duties of MET institutions is to prepare their cadets for the future and not for the past. That is not to say that the past is not important and while the MET institutions need to learn from previous experience and accidents, especially as for every death there are some 500 incidents and for every accident there are some 10 major near-misses (UK P & I), the METs have a major responsibility to initiate and support research identifying the causes of incidents and near-misses and through research find out how accidents can be prevented in the future. The European Union has a history of supporting well-written proposals which promote innovation and its transfer. The following are a summary of identified deficiencies and how several European MET institutions and progressive maritime enterprises have come together to address some of these deficiencies such as those which have led to, automation failure (SURPASS, 2009-2011) and those resulting from communication failures (MarTEL, 2007-2009). Two major consortiums were formed to seek support from the EU and to conduct research with a view to reduce failures in the two identified areas of concern. Several other initiatives were also instigated to make the profession more attractive to young people (ATRACT-ME, 2010) and harmonise the MET in Europe around the STCW and IMO model courses (SOS , 2005-07) and hence reduce development and maintenance cost as well as projects to make self- and remote- learning a reality (EGMDSS, 2007-09 and EGMDSS-VET, 2008-2010).

The Key questions are as follow: Are the proposed changes based on the lessons learned from accidents such as the Savannah Express (2005) or PROSPERO (2007) accidents due to automation failure, or not? Has the IMO adequately reviewed the view of the International Maritime Lecturers Association (IMLA, 2009) with regard to establishing the basis for regulating the standards for maritime English? The authors are of the view that the changes

so far and those proposed do not adequately respond to findings of reputable authorities and professional associations in the maritime community.

The study presented in this paper also surprisingly supports the findings of two reports submitted by the MCA to the IMO MSC82 (reports MSC 82/15/2 and MSC 82/15/3, 2006) regarding automation failures. Automation has brought with it a new problem and specific types of accidents which need to be fully understood if accidents due to automation failures are to be a thing of the past.

The work reviewed as part of this investigation considered the outcomes of several European Union (EU) education and training initiatives (See bibliography). These include several Leonardo pilot projects, SOS, 1997, HIICOSS I, 1997; SAS, 1998; NORAY, 1999; ORION, 2001; CIVILPRONAVY, 2001; FISHTRAIN, 2001; SECURETAS MARE, 2002; HIICOSS II, 2002; NETOSKAR, 2003. The results of a number of research and development programmes such as METHAR (2002) and METNET (2002) were also taken into consideration exploiting; in addition, the information contained in (SPIRIT, 2007). The work being conducted under the EU funded Leonardo Safety On Sea (SOS, 2007) Project led to a paper (Ziarati, 2006) which identified several causes of the accidents as education and training problem areas for analysis, these are depicted in a the following diagram:

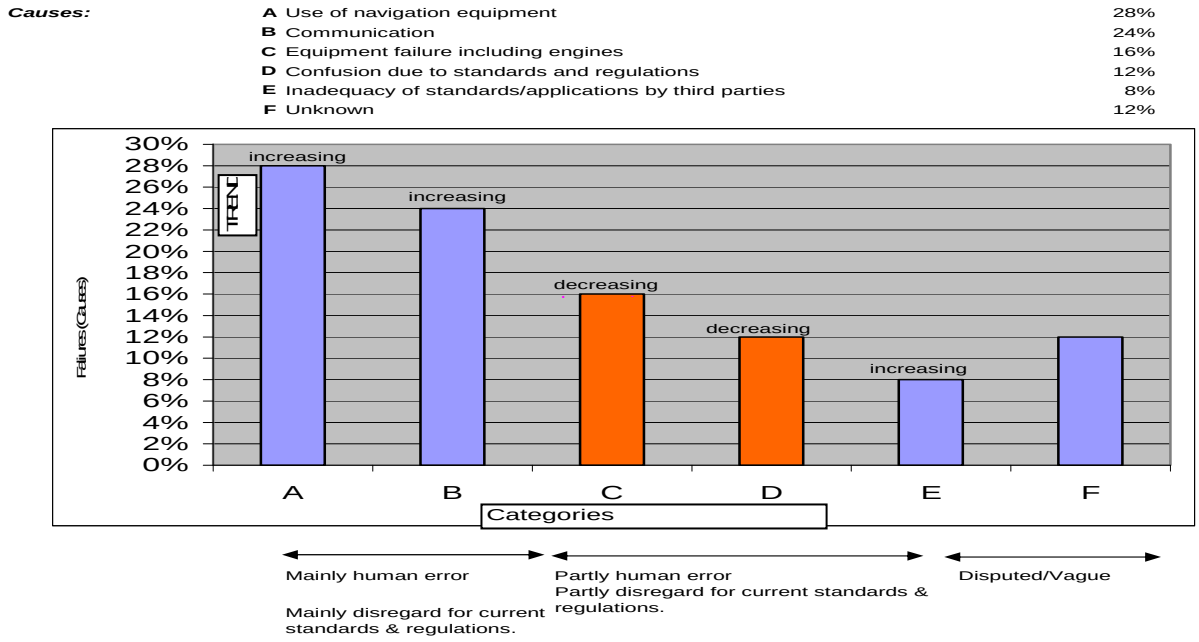

Fig 1. Pareto Chart identifying main sources of problems (Source: Ziarati, 2006)

The SOS project (ibid) demonstrated that for the MET programmes to be more effective it is crucial that they are underpinned by a vigorous programme of research and development; and to share this burden and learn from one another, it is good practice to form a partnership and be willing to solve or analyse a problem or deficiency and incorporate the

situation/outcome into the maritime provision. The introduction of BRM, ERM and Ship Handling (SH) by the maritime industry and their inclusions in the MET programme of officers of watch was considered an innovative undertaking by many MET institutions. It is pleasing to note that the proposed changes to STCW will make these courses mandatory. This is just an example to show that innovation can be highly beneficial and that it is possible to work from the outside and then offer opportunities for the regulatory bodies to adapt a given good practice. In the same way the EU funded SURPASS project may lead to a successful course on automation which one day will be adapted by the IMO or one of the licensing authorities. There was a paper to the IMO (Cole, 2010) and presentation by the MarTEL team (MarTEL, 2007-09) at the IMO's STW meeting on 12 January 2010 to promote the inclusion of more regulated standards for maritime English. Who knows maybe the EU funded MarTEL project and its standards one day are to be seen as the standards for maritime English worldwide. Another example is a new EU funded project called M'AIDER (2009-2011) which is expected to study accident reports and research such as those presented in figures 2 and 3 and in parallel conduct surveys to identify the causes that have led to near misses which are reported but not investigated by accident investigation agencies. The outcome of M'aider is considered important in preparing seafarers for emergency situations.

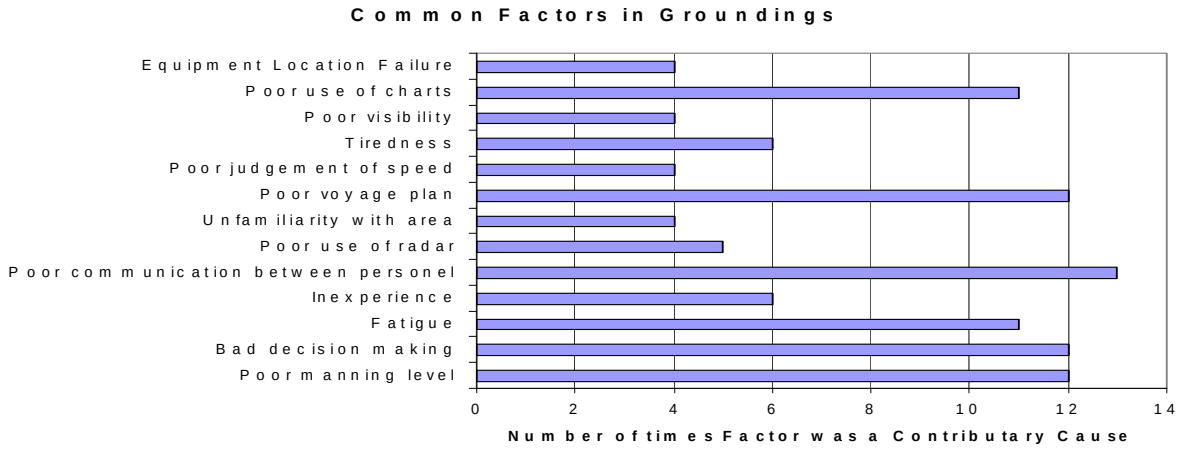

Fig 2. Common Factors in Groundings (Source: Ziarati, 2006)

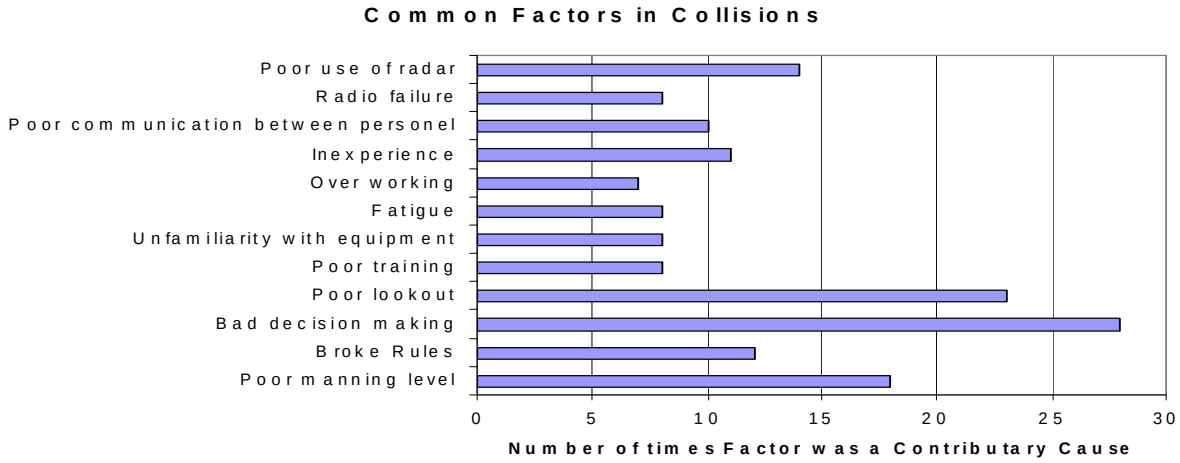

Fig 3. Common Factors in Collisions (Source: Ziarati, 2006)

8. Conclusion

Although several attempts took place to revise STCW-95 in recent years, especially June 2010 Manila Conference, it is believed that implementation of these revisions will take time and there remains a number of deficiencies in STCW even if all of the proposed changes are implemented. Since 1995, there has been rapid revolution in design of ships and the equipment used in the navigation and propulsion systems on board these ships. One very important development has been the introduction of automation in operating a ship. The modern ships particularly container and fuel carrying vessels are becoming increasingly automated. The automation has brought with it two problems, one concerning the inadequacy of existing seafarers' education and training viz., that if any aspects of automation fails the crew often are not trained to use alternative systems and hence respond to it effectively (IMO MSC 82, 2006; Ziarati, 2006). The second problem has arisen from the review of the arguments from the recent IMO Maritime Safety Committee meeting (reports MSC 82/15/2 and MSC 82/15/3, 2006) namely that the human operators rarely understand all of the characteristics of automatic systems and these systems' weaknesses and limitations which have now been found to be the main causes of accidents. These reports concluded that there is a need to improve the content of all maritime training and that the knowledge, skills and understanding of automation should be included in the basic training of all Chapters of the STCW Code of practice and hence address this very serious issue at source. Furthermore, to address the second problem, it is considered feasible to gather the knowledge for inclusion in the existing seafarer's education and training in a short course format that can be easily introduced for existing seafarers and hence enabling the seamen currently working at sea and in ports to develop the competence to handle and respond to automation failures. To overcome these problems TUDEV has instigated an EU project with several partners from EU

called **SURPASS**. The project started in October 2009 and will be concluded in September 2011.

The main aim of the project is to transfer the innovation already developed in the design, delivery and assessment of short courses in order to fill the gap created as the result of emergence and application of the automated systems in the education and training of seafarers by the provision of a training course enabling them to have a full understanding of automated systems and these systems' weaknesses and limitations and receive International/European-wide recognition for it.

The partnership is composed of two small progressive high technology SMEs and several major merchant navy education and training (MET) institutions supported by their awarding, accrediting and/or certificating authorities. Some of the partners have recently been involved in harmonising and complementing the existing MET programmes in the EU (Safety On Sea, SOS 2005-07) and some have developed an innovative e-learning and assessment platform as part of the current Leonardo Pilot project (E-GDMSS, 2006-2008). The platform has been successfully tested and evaluated using two groups of trainees composed of different people from different maritime education and industrial sectors. The proposal instigator was the representative of IMarEST at the IMO MSC (2006) and at the same time a member of a national delegation at the event.

TUDEV is also involved with a Leonardo pilot project which started in November 2007 named **MarTEL** concerning the transfer of innovation by reviewing the accidents and incidents and identifying causes of these accidents albeit primarily due to language competency. Several other countries would like to become involved with this project.

The two new EU funded project started recently viz., **SURPASS** and **M'AIDER** are expected to be as successful as the recently concluded projects SOS, TRAIN 4Cs, MarTEL and EGMDSS). TUDEV is also a partner in the EU funded **EBDIG** project which aims to transfer innovation from the automotive sector to smaller vessels and boats.

TUDEV has achieved a great deal in receiving recognition for its Merchant Navy Education and Training programmes for both deck and marine engineering officers through the Leonardo Safety on Sea (SOS) Project. The SOS project also helped TUDEV to become involved with other National and European projects as repeated earlier. There are now over 30 major centres working with TUDEV supporting various European Projects. .

The vision of TUDEV is not only to support the maritime industry in Europe but also look into the future and make an attempt to identify the trends and prepare the industry. TUDEV's training and education philosophy is primarily based on skills and competence preparing the young people not for the past but for the future through self studies, student centred activities, group and individual assignments and a series of other skills essential for a well rounded and confident person.

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New Technologies for Fast and Integrated Maritime Simulation for Training and On-Board Application

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Abstract

New technologies as Fast Time Simulation (FTS) and serious game engine software have great potential for teaching and learning in the maritime training environment and for use on board of ships. New concepts for application of these new technologies were developed at Maritime Simulation Centre Warnemunde MSCW in research projects for development of prediction tools for manoeuvring of ships and for training of safety and security elements.

A new type of simulator called the Safety and Security Trainer (SST) was developed using new technologies of game engines: The SST simulator was further developed in a research project dedicated to the enhancement of passengers' safety on RoRo-Pax-ferries where a 3D-model of such a ship was implemented for full 3-D training environment for scenarios representing fire fighting, water inrush and security measures. An integrated support and decision system, called MADRAS, was interfaced into the SST and the entire system was interfaced to the Ship Handling simulator in order to assists officers in coping with safety and security challenges during manoeuvres of the vessel.

New concepts for on board displays and prediction tools based on FTS were developed to simulate the ships motion with complex dynamic models in fast time and to display the ships track immediately for the intended or actual rudder or engine manoeuvre. These simulations allow on one hand for new type of manoeuvring design as enhancement of the pure way point planning and on the other hand of unmatched monitoring of Shiphandling processes to follow the underlying manoeuvring concept.

The paper will introduce the basic concepts and examples will be given for results from test trails in the Maritime Simulation Centre Warnemunde interfacing the full mission ship handling simulator, engine simulator and the Safety and Security trainer SST for complex integrated exercises.

1. Integrated Simulation at The Maritime Simulation Centre Warnemuends(MSCW) with New Element SST

1.1 Integration Concept

The Maritime Simulation Centre Warnemünde (MSCW) is one of the most modern simulation centres worldwide (e.g. Benedict 2000). The complex simulation platform (Figure 1) with several full mission simulators enables the department to simulate the entire "system ship" with the maritime environment including VTS and offers challenges to officers and crew on board the vessels (http://www.sf.hs-wismar.de/mscw/). The simulator arrangement (MSCW) comprises already a Ship Handling Simulator SHS with for 4 Full Mission bridges and 8 Part Task Bridges, a Ship Engine Simulator SES with 12 Part Task station and a Vessel Traffic Services Simulator VTSS with 9 operator consoles.

Figure 1. Overview on MSCW (left), Bridge 1 of Ship-Handling-Simulator (SHS) with new Displays of Bridge Safety & Security Centre of SST and MADRAS Decision Support System (right top) and Training room of new Safety & Security Trainer of SST (right bottom)

The new simulator, implemented as Safety and Security Trainer SST, was designed by the manufacturer Rheinmetall Defence Electronics Bremen in co-operation with Wismar University, Department of Maritime Studies (Meyer & Benedict 2007, Benedict et al 2008). The simulator was originally designed in a basic version and 2D presentation and is now being developed into a 3D version. The simulator can specifically be used for stand alone and for integrated training with the SHS (Figure 2). Beside the use for training, the simulation

system will be installed and used also for specific simulation based studies into potential upgrading of existing safety and security procedures.

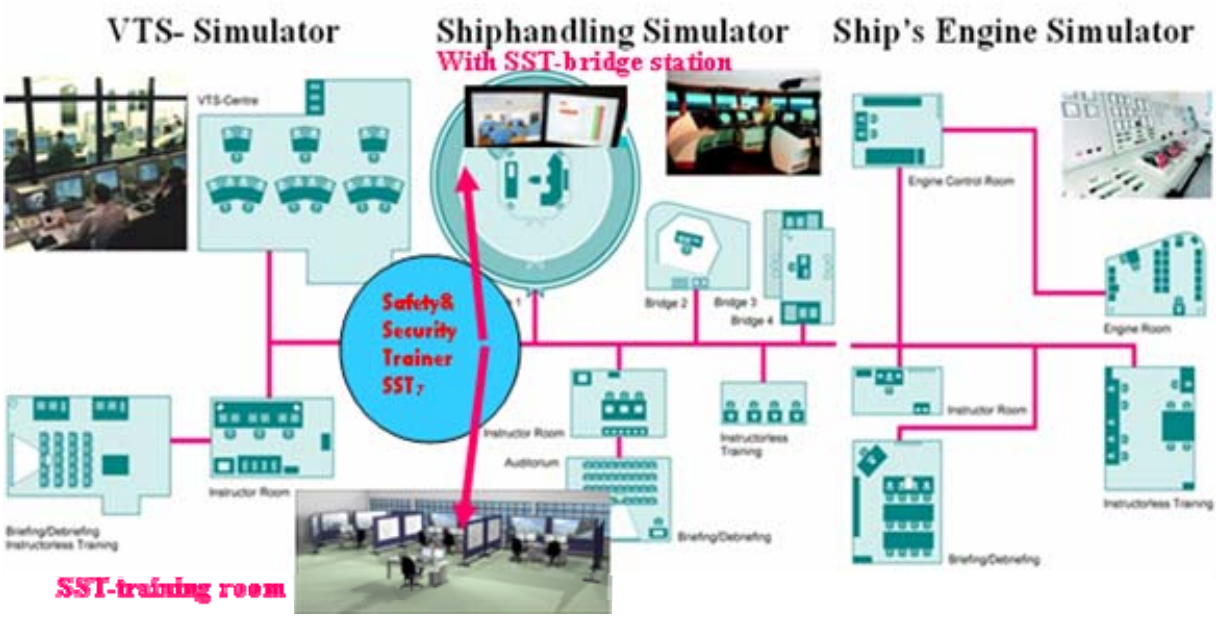

Figure 2. Simulation Centre Warnemünde (MSCW) – structure and interfacing network with new Safety & Security trainer SST

1.2 Workplace Concept of Safety- And Security Trainer (SST)

10 stations are being installed in the MSCW this year, eight training stations (one of the stations on the SHS bridge 1) and two instructor consoles as well as one communication computer system and another computer for a new support and decision system called MADRAS. Each station (with head phones or microphone for communication) consists of two monitors. One screen is used as Situation Monitor and the other is named Action Monitor. The workplace concept provides full equipment for comprehensive safety and security training (Figure 2. , bottom).

The observer perceives from a bird's eye view of one deck inside the simulated ship and which is the main perspective on the situation monitor. A person simulating a member of the crew can be moved through the decks. Positioning the figure on specific IMO symbols the related safety equipment is indicated as generic panel on the action Monitor. All interaction is done on the action monitor. If the „Strategic Figure" is not located on symbols representing safety equipment, the action monitor shows the ship safety plan of the appropriate deck. The main desktop displays an overview about one deck. The menu bar provides access to other windows. It is possible to create new exercises and store replays. Also malfunctions, fire, water inrush and criteria for the incorporated assessment can be set. The actual ship status as indicated by draught, trim and list angle is shown. The name of selected person, health index and moving type (standing, kneeing and lying) is shown in the status display window, also the

kind of protective clothes worn by the figure. A single mouse click selects a person, e.g. Captain, which can be moved normally or quickly to any other position and to the IMO symbols, in which case the action monitor will show the related operable switch gear or the emergency equipment according to the Ship Safety Plan.

Integration of Fire Fighting System and Fire Fighting Equipment: Most of the actions performed by the trainees with the safety equipment are performed on the action monitor. A fire model optimised visually and given obvious realistic effects for easy perception by trainees, is incorporated into the simulator. A modern fire alarm management system with smoke detectors and manual calling points is built into the interior of the ship and easily flammable materials are protected by fire resistant A60 walls and doors.

The fire model includes smoke visualisation and a fire fighting system and equipment such as fire extinguishers, water hoses and hydrants, breathing apparatus, CO2 systems and foam. This enables the trainee to simulate a realistic fire fighting situation on board and interact with supporting teams as well as the management team on the bridge and in the engine room. During the simulation the strategic figure's health condition is monitored in relation to oxygen, smoke, temperature and other health influencing parameters and the measurements are monitored in diagrams.

Integration of Water Inrush System: One further feature of the simulation system is a model calculating water inrush and its influence to the stability of the ship. A ballast system is implemented and can be used during simulation of an emergency instance to help stabilize the ship. The trim and stability calculator is used to predict the effect of a water inrush and show the stability, bending moments and share forces. Water tight doors are built into the modelled vessel. The ballast and stability measuring system is implemented in the simulator, which enables the trainee to take countermeasures.

1.3 Specific Simulation Features of SST

Integration of innovative 3D-visual model of SS: One of the most interesting innovations at the MSCW is the 3D-designed RoPax ferry "Mecklenburg-Vorpommern" (Figure 3) for the SST. The first step was to make an application of the ship plans which were intricately realised in a 3D Studio Max version for test trials of the 3D-visualisation of the entire vessel. All decks of the RoPax ferry are now available in the 3D-version and integrated along with the dynamic safety equipment into the games engine by RDE. Functional tests of the developed system are in progress and already running successfully.

Figure 3. Co-operation between Hochschule Wismar and shipping company Scandlines in VESPER: Ferry "Mecklenburg Vorpommern" as object for simulation in SHS and SST (left) and Deck 6 (right) of the RoPax ferry in 3D visualisation

Safety and Security Components in the 3D Visualisation Model: In contrast to the 2D model, where the strategic figure is guided through the decks, now the trainee in the 3D model moves and reacts from his own perspective and can operate the entire spectrum of safety equipment on board the vessel. In the case of fire he activates the alarm from the next manual calling point. According to the safety procedure on board, and after the release of the fire alarm from the bridge, the fire squad team (each trainee with specific role) will operate the fire fighting equipment including the breathing apparatus, fire protection suits, fire extinguishers, fire hoses and other tools located in the safety lockers or placed in the fire boxes (Figure 4Figure 4.)

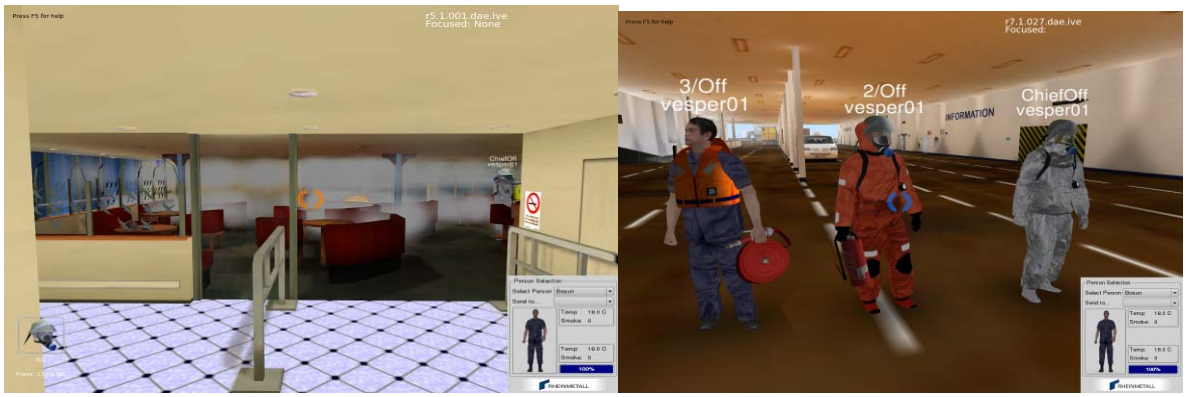

Figure 4. Fire fighting / smoke propagation in public area (left) and Crew in action with fire fighting equipment car deck on deck 5 of the RoPax ferry

On the bridge and in the engine control room (Figure 5) all the operational consoles including; steering panel, fire panel, alarm panel, ballast- and stability panel and the water drenching system, are designed to a generic model and can be integrated on other designed vessels as well. All consoles and panels on the bridge and in the ECR correspond to the integrated sensors placed all over the vessel. The Master and officers operate an interactive board system and can be trained in a wide spectrum focussing on safety and security procedures.

Figure 5. Bridge and Engine control room with interactive consoles

In addition, the security components can be practised on the new simulator. For example the RFID based appliance, which is integrated into the SST bridge station, enables the officer to observe the movement of persons on board. In all security declared areas the doors are locked and the areas are accessible only by entering the specific code into the lock system beside the doors. On all decks cameras are installed and can be monitored from the bridge station. The camera view can be changed and adjusted by the instructor. In the case of a bomb alert the crew can investigate the affected area with a bomb detector. On approaching any dangerous object, the detector sounds alarm.

Support and Decision System MADRAS: The simulation platform includes a new support and decision system called MADRAS. This system was designed by MARSIG mbH Rostock and especially tailored for the SST simulator and the simulated RoPax Ferry "Mecklenburg-Vorpommern". The MADRAS computer is linked to the simulator and receives the sensor data from the SST. The control module selection contains the following elements for automatic survey; FIRE, EXPLOSIVES, SECURITY, EVACUATION, GROUNDING and FLOODING. In the event of any sensor alarm the Madras menu opens and displays the affected deck/area with the activated alarm sensor. MADRAS is an interactive system and is a helpful tool for Master and officers in critical situations. The system guides the officer through all necessary choices and helps in finding the correct emergency procedures. This helps to avoid dangerous mistakes and ensures not missing any steps imperative for the safety of the vessel. MADRAS was recently installed into the SST and is still under development. Test trials are running successfully. The basic system of MADRAS was tested on board of the ferry "Mecklenburg-Vorpommern" during the last two years.

2. Fast Time Simulation Technology Used for Manoeuvring Prediction

2.1 Introduction

The role of computer based simulation is increasing on the ships bridge. Prediction tools are very helpful and already in use on ships for a long time. Well known is the so called Trial Manoeuvre mode in Automatic Radar Plotting Aid (ARPA) radars to be used in order to analyse future encounter situation for selected relevant course and speed alternatives to check potential collision avoidance strategies.

With the emerging Electronics Chart and Information Systems (ECDIS) new tools were introduced e.g. for supporting voyage planning by means of manoeuvring characteristics. For controlling the ship on her route the future track of the ship was shown as a so called "curved headline" overlay in ECDIS.

However, the existing prediction functions are very simple only, based either on intended future constant course and speed values as in the ARPA trial function or on estimated courses and tracks based on the simple integration of the current ship motion parameters as rate of turn and speed components to be considered as constant in ECDIS.

The simplification of these predictions allows restricted use only. That is why new concepts for on board displays and simulation tools were developed using an innovative approach which includes the immediate response on changes of rudder and engine commands for the display of the future track. This approach was investigated in research projects, dedicated on the one hand to the further development of user interfaces on ships navigational bridges and to investigations into potential improvements for manoeuvring assistance on the other hand.

A fast time simulation tool was developed to simulate the ships motion with complex dynamic models (Benedict et al 2006) to be used to display the ships track immediately as prediction for the commanded rudder and engine manoeuvre (Benedict et al 2007). Generally there are two areas of application of such a tool. It can be seen both as training tool for ship manoeuvres and to be used as assistance tool on board vessels.

- Training Tool: The prediction of ships motion as an immediate response could be an excellent method to demonstrate the results of changes or alternatives of using manoeuvring control devices as for instance propellers, rudders or thrusters. This is of increasing importance specifically for the growing complexity of manoeuvring control systems starting from simple one-propeller and middle rudder, via twin-propellers with double rudder up to new azimuth propellers which can be turned by 360° (there are ships with even four of these sophisticated thrusters).
- Decision Support Tool: Predictions as elements of on board displays can be used as in the loop control elements to steer the ship manually but supported by the future track or speed indication in the ECDIS interface. Furthermore the results of background calculations for important manoeuvre elements in collision avoidance can be used to pre-calculate action margins to be used in collision avoidance displays.

2.2 Presentation of Dynamic Predictions in ECDIS Environment

For a compact presentation of information to the captain, pilot and responsible navigating officer respectively a new layout of a conning display was designed and implemented into the equipment of an integrated navigation system (INS). The display layout contains an overlay of ECDIS and CONNING information together with the prediction (Figure 6).

In the centre the ECDIS information in Head-up Mode together with motion parameter for longitudinal speed and transverse speed as well as a circle segment with the rate of turn is shown. The ships position is displayed in the centre of the ECDIS as ships contour where the track prediction can be indicated as curved track or as chain of contours for the selected prediction time. The prediction parameters as range or interval of presentation can be set in the control window at the right side.

The predicted track for the simplified prediction is shown as solid curve. According to the actual rate of turn to starboard the conventionally predicted track is presented as a circle segment to the right side as track for the time range of 5 min.

The simplified prediction coming from integration of current constant motion parameters is depicted as magenta track and shows a small turning to STARBOARD. The dynamic prediction with the full simulation model is shown as a set of ships contour. The dynamic prediction (right track / ship contours with turning to PORT) reflects the setting of rudder and propeller parameters shown in the left bottom window. In this example a ferry is used with two rudders and two Engine Order Telegraphs for the two controllable pitch propellers. This interface allows for a presentation of dynamic predictions of steering and stopping characteristics as an immediate response according to the current steering handle or engine order telegraph position.

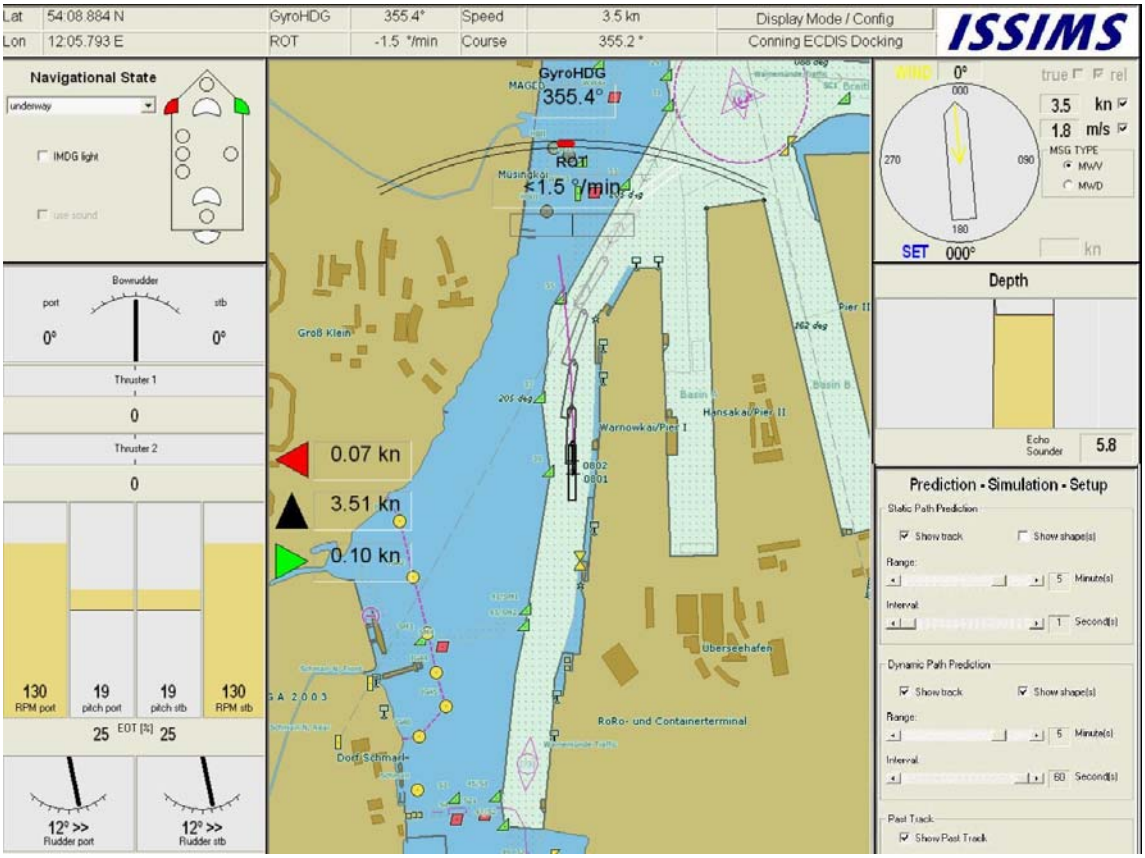

Figure 6. Layout concept for Manoeuvring Prediction in ECDIS (left) with integrated presentation of different track predictions (centre) for rudder manoeuvres

2.3 Investigations into The Effects of Predictions on Ship Handling

For the purpose of testing the technical feasibility and user acceptance the new conning display with integrated prediction functions was implemented in the INS equipment of the large full mission simulator bridge of the Ship handling simulator of MSCW. One of the sample ship was the RO-PAX Ferry "Mecklenburg-Vorpommern" with Loa=200m, Boa=28,95m, Draft=6.2m, Displacement=22720t and Speed=22kn. She has two pitch propellers and two rudders located behind the propellers and additionally one bow thruster.

Several test scenarios were developed for a simulation study with ship officers and masters during test trials at Rostock Sea Port. The ships were entering the port to be steered through the fairway and to be berthed in the dedicated basin. Before berthing the officer on watch has to turn the ferry in the turning area and to go astern to the berth.

Figure 7 shows a snapshot of the complex manoeuvre for combined stopping and turning. The predicted contours during the stopping manoeuvre allow the estimation of the stopping distance and even the consequence of going astern if the engine will be kept in reversed operation together with the effect of rudders and thrusters. In contrary the simplified predictor indicate a nearly straight motion with the constant speed at the beginning of the manoeuvre.

After turning the ship by means of the bow thrusters the ship will be moved in astern direction into the harbour basin for berthing the vessel.

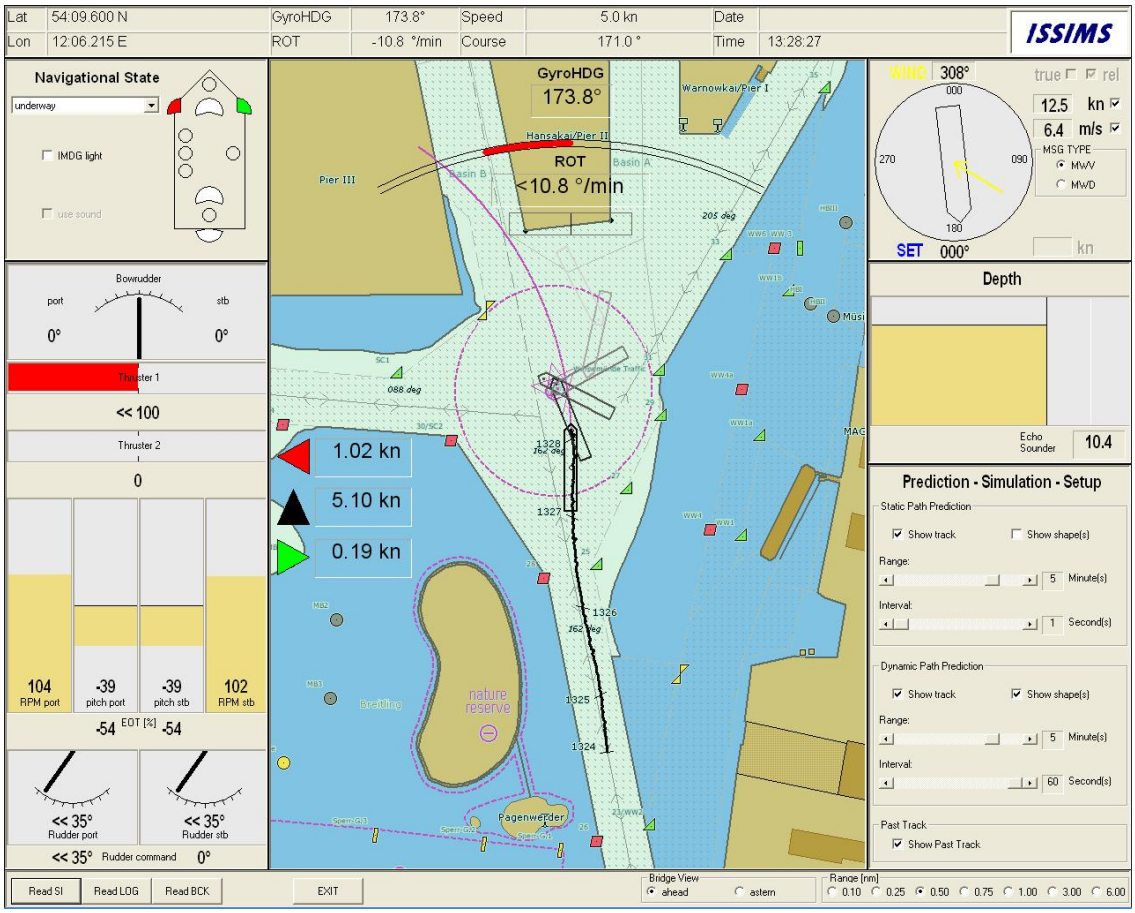

Figure 7. Comparison of predicted tracks based on different methods for combined stopping and turning manoeuvres at the turning area

In figure 3 the ship is using rudders and bow thruster according to the indicators on the left side. The simplified prediction from integration of current constant motion parameters (left track, result from current PT turning of bow) and the sophisticated dynamic prediction based on full math model (right track / ship contours going astern and turning into harbour basin) are shown.

Investigations for improving manoeuvres in ferry operation in the port of Rostock were made to analyse the performance specifically in the turning area. Analysing the VDR recordings from ferry approaches it was found that there is some space for improvements. Applying the predictor new strategies were found to save up to 25% of time in this area which is very important in tight time schedules (Fischer & Benedict 2009).

The application of the predictor is currently extended in the ship handling simulator (SHS) of MSCW. There it has proven some benefits for education and training because it enables the simulator instructor to immediately demonstrate complex manoeuvres in training sessions which needs less time in comparison to real time simulation. In order to en-able even

a simulation on board as a trial manoeuvre to check for an optimal manoeuvre strategy an on-board simulator was developed with a display oriented control panel for the ships manoeuvring handles (see Figure 8).

Figure 8 Interface for Simulation / Trial mode based on manual input for simulated manoeuvres via the steering control panel on right side of display for manoeuvre planning and training

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Knud BENEDICT graduated from the Faculty of Naval Architecture of the Rostock University in 1972. He achieved his Doctorial Degree in Ship Hydrodynamics / Manoeuvrability (1978) and his Habilitation on Ship Operation Technology / Advisory Systems (1990).

Currently he is Professor for Ship's theory at Wismar University. Furthermore he is Visiting Professor at World Maritime University Malmoe for Marine Technology. Until 1997 he was the Dean of the Department of Maritime Studies at Wismar University and since 1998 he is the Head of its Maritime Simulation Centre Warnemuende.

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Michael GLUCH graduated from the Maritime Academy Warnemuende in 1991 and achieved his Doctorial Degree in Automation Sciences in 2008. He is chief coordinator for research at the Hochschule Wismar and head co-ordinator of the manoeuvring prediction software.

Matthias KIRCHHOF achieved his MSc. in the field of automation and control engineering. He is working on the development of the fast time simulation, computer-based optimization and evaluation tools.

Assessing Maritime Students' Learning Outcomes in Information Literacy

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Abstract

As more information technologies are infused into the maritime environment it is becoming vital for today's mariners be information competent. In the maritime curriculum, assessment in information literacy is fundamental to determining maritime student's ability to access, evaluate and use information effectively. This paper "Assessing Maritime Students' Learning Outcomes in Information Literacy" outlines the Stephen B. Luce Library's Information Literacy Instruction Program at the State University of New York Maritime College, with a focus on the various activities and tools used for assessing student learning outcomes. The Library has established a comprehensive instructional program that is integrated across the maritime curriculum enhanced with various pedagogical tools such as hands on experience, online guides, and multimedia tutorials. This instructional program is designed to begin developing maritime students' information literacy skills from their first year and continue throughout their course of study, including Summer Sea Terms aboard the Training Ship Empire State. Also, as the technology for information access advances, the library keeps up to date by implementing state of the art tools to ensure students are exposed to the technology for advancement of their information literacy skills. In addition, The paper reviews in detail the methodologies used to implement assessment procedures and the assessment instruments used to gather data; and how national information literacy standards are applied to designing these methodologies and instruments.

1. Introduction

Assessment, with emphasis on student learning outcomes, is an increasing trend in higher education and the Maritime curricula. United States Accrediting agencies such as ABET, Coast Guard (STCW 95), Middle States Association of Colleges and Schools, Western Association of Schools and Colleges, and other similar agencies are now looking at assessment as the key factor in the accreditation review process. In 2002, U.S. Middle

States Association of Colleges and Schools introduced an assessment component in every accreditation standard and shifted the review process to focus not on institutional resources and processes but on assessment and how well the institution is achieving its goals, including how well students are achieving learning outcomes (Middle States Commission on Higher Education 2005).

In the mid 1990s as information evolved in many different formats, maritime libraries increased emphasis on library instruction programs and information literacy emerged as the instructional framework to develop students' competencies in analytical skills and critical thinking. The American Association of College and Research Libraries (ACRL 2000) defined information literacy competency standards as "…a set of abilities requiring individuals to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information." Information literacy, as defined, is the basis for lifelong learning because a student who graduate with the ability to locate, evaluate, and effectively use information can learn independently and address their own needs and questions in any area of life (Breivik 2000).

Assessment of student learning outcomes is essential to evaluating library instruction programs. Are students really developing the information literacy skills necessary to become lifelong learners? Libraries have been conducting information literacy assessment practices since the mid 1990s and, as Lindauer (1998) stresses, "assessment of library performance should be defined and shaped by its connections and contributions to institutional goals and the desired educational outcomes." These outcomes-based assessment can be conducted either as an independent library-only project or integrated into a campus-wide assessment project such as general education program. Accrediting bodies such as U.S. ABET and U.S. Middle States are now mandating the assessment of learning outcomes in information literacy. Middle States (2002) explicitly states that as part of the accreditation standards there has to be "assessment of information literacy outcomes, including assessment of related learner abilities." This paper describes the assessment activities of the Stephen B. Luce Library Instruction program and discusses the assessment findings as it relates to student learning outcomes.

SUNY Maritime College is one of the 64 colleges and universities of the State University of New York system. A four-year college located at historic Fort Schuyler in Throggs Neck, Maritime College offers a solid academic program coupled with a structured cadet life in the regiment for both men and women. Maritime College prepares students for careers through a content-centered curriculum and a hands-on, team building approach to learning. Maritime offers undergraduate and graduate degrees, 23 varsity athletic teams, summer training cruises to Europe, United States Coast Guard license and intern programs (SUNY Maritime College Website 2009).

The Stephen B. Luce Library of SUNY Maritime College is accredited by professional organizations such as the United States Middle States Commission on Higher Education and

it adheres to the standards and guidelines of the American Association of the College and Research Libraries of the American Library Association. The Luce Library is the oldest academic maritime library serving the community of the oldest maritime academy in the United States, -SUNY Maritime College - founded in 1874. The Library's collections and resources support the research requirements of the maritime disciplines in marine transportation, engineering, science, global business and transportation, and the humanities (Constantinou 2008).

2. The Stephen B. Luce Library Instruction Program: Integrating Information Literacy in the Maritime Curriculum

The maritime curriculum has rigorous academic demands, including an unusually high number of degree credits, several semesters at sea, and license examinations. The Luce Library designed an equally rigorous and complimentary information literacy program to support the maritime core curriculum. The Library's instructional program systematically integrates information literacy skills throughout the maritime curriculum to foster lifelong learning. As Ward (2006) stated, "Students do not achieve information literacy skills by attending one or more library sessions. Rather, students learn relevant information skills when they are systematically integrated and sequenced throughout the curriculum" (p. 397). The Library's instructional program includes:

- Orientation sessions that serve to introduce all incoming students, freshmen and graduates, to the Library's facility, physical environment, personnel
- Introductory basic skills sessions where all freshmen are introduced to the information literacy concept
- Course and discipline specific classes where upper level and graduate students receive advanced information literacy instruction
- Research Assistance Program for one to one in-depth researching instruction
- Web-based guides that are discipline, subject and course specific
- Integrated online information literacy tutorial that serves the need of online learners, including distance students

Using the various venues of instruction, the Library's instructional program concentrates on three key strategic directions to successfully integrate information literacy in the core maritime curriculum: librarian – professor collaborations, student outreach, and instructional tutorials.

The first strategic direction focuses on librarian-professor collaborations. The literature stresses that such librarian and professor collaborations are critical to developing effective information literacy instruction and student learning outcomes. Mackey and Jacobson (2005)

refer to librarian-professor collaboration as "teaching alliances" that involves working together in course planning, classroom instruction, and assessment. Librarians at Stephen B. Luce Library hold dual advanced academic degrees and are well positioned to liaison with other academic departments. Collaborative activities include information literacy meetings to conduct syllabi analysis and create appropriate assignments for course-integrated library instruction; and presentations and demonstrations of new and existing library resources at department meetings and other faculty group sessions. Collaboration continues via campus-wide committees such as Curriculum Committee and Faculty Assessment Committee where librarians are constantly working with teaching faculty on integrating information literacy into new and existing courses and assessing student learning outcomes.

The second strategic direction of the Luce Library instruction program focuses on student outreach. The Library's Information Literacy program is designed to develop students' skills at various levels of their academic studies. To begin, an extensive library orientation program provides all new students with an introduction to information researching and the information literacy concept. During this orientation students become familiar with the Library facility, the physical environment and locations of resources, the library personnel, and the history of the library. To continue integrating information literacy skills, the first year (freshman) students receive a basic skills introductory session that is conducted in common core courses such as LEAD 101 (freshman orientation course), and introductory English, History, Science, Engineering, and International Trade and Transportation (ITT) courses. Upper level students further develop their information literacy skills with a more discipline/assignment-specific library instruction session that is integrated in higher level courses such as English composition, American History, American Civilization, Business and Economics, General Science, Marine Biology, Oceanography, and General Engineering. Graduate students receive in-depth information literacy sessions for various courses, including preparation for the graduate capstone course. The Library's Research Assistance Program, a one-on-one information literacy session, serves as an additional instructional vehicle to students at all levels.

Creating web-based guides, online pathfinders, and other online instructional materials forms the basis for the third strategic direction. These online publications give students the tools necessary to continue improving on information literacy skills outside of the classroom. In addition to developing general subject pathfinders, library faculty liaisons constantly collaborate with instructors to create course-specific research guides. Also, distance learners can access tools such as the online information literacy tutorial to develop their own lifelong learning skills without having to be in the traditional classroom.

3. Outcomes Assessment for Stephen B. Luce Library Information Literacy Program

Stephen B. Luce Library instruction program integrates information literacy in the maritime curriculum and assessment of this program provides a quantitative means of documenting progress towards the College's educational goals. The Library's instructional program is structured in a way that all efforts are concentrated to contributing to program accreditation and program outcomes. Recorded assessment of the Luce Library Information Literacy program goes back to the year 2000, where data were quantity based as to the capacity of the program and not based on learning outcomes. As higher education institutions and accrediting bodies focused more on learning outcomes, the Luce Library information literacy assessment activities were revised and revamped to generate student learning outcomes data. In 2004, the Library instruction program underwent the first assessment process to generate student learning outcomes data as part of the campus-wide and State University of New York (SUNY) – wide general education assessment. The SUNY general education assessment is based on a three year cycle and thus in 2007 a second set of student learning outcomes data were generated. For the first time multiple data sets were available for comparison. At present, assessment of the Library instruction program has shifted from a 3-year cycle project (for Gen Ed) to a more sustainable effort annually and new tools and methodologies, specifically pre-test and post-test processes, have been included to generate key comparative data to better assess student learning outcomes. Ongoing review and revision of the Library's information literacy assessment plan takes place once a semester at the campus sponsored biannual event "Faculty Assessment Day." The Faculty Assessment Day activity, implemented by the college's Provost, is an intense day-long activity where the Library and other academic departments review their assessment plan and generated learning outcomes data, revise the plan with new action items, and present the results to the faculty.

4. General Education Assessment

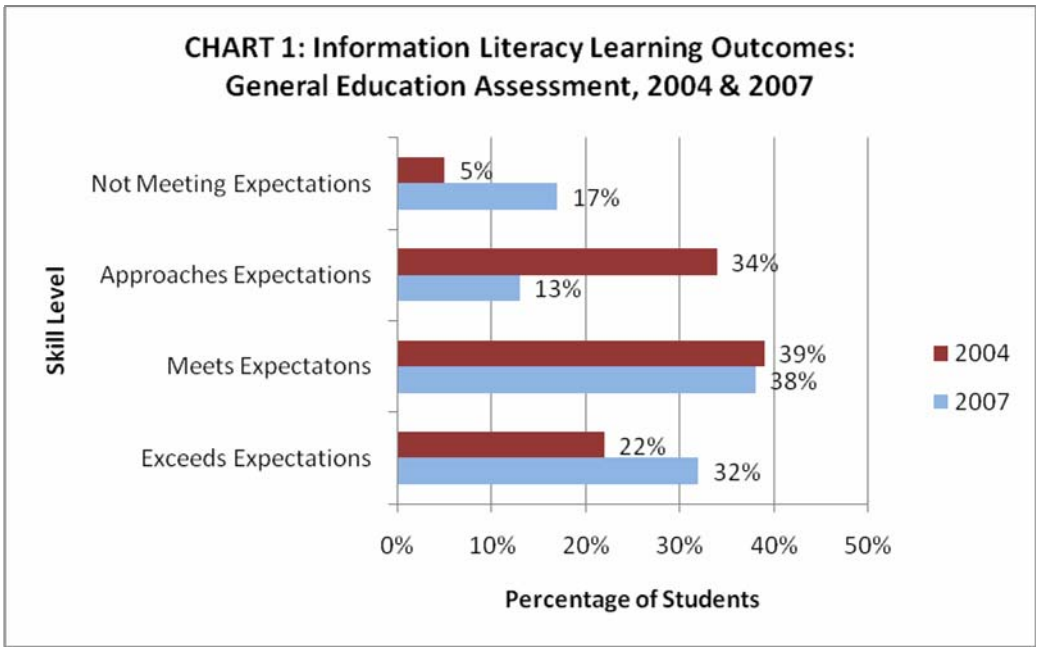
In 2002, The State University of New York (SUNY) implemented a rigorous and comprehensive campus-based assessment process, including assessing campus success in meeting student learning outcomes in general education requirements for ten subject areas and two learning competencies – critical thinking and information management (SUNY). Maritime College, one of the 64 campuses of SUNY, commenced the general education assessment exercise in 2004 and, on a three-year cycle basis, repeated the exercise in 2007. The Library was a key participant in generating student learning outcomes data for information literacy skills and lifelong learning. For the general education assessment the Library established two objectives which correlate with the ACRL standards for information literacy:

- Understand and use basic research techniques
- Locate, evaluate and synthesize information from a variety of sources

Measuring instrument: A standardized test, comprising of short answers and yes/no questions, was the measuring instrument used to gather data. This test assessed students' research skills, including abilities to locate and evaluate information from a variety of sources and formats. Sixteen questions, with a total points scale of 16, assessed how well students can conduct basic and advanced searches in the Library online catalog and research databases, search for print information using indexes and periodicals, and locate and evaluate web sources. To minimize "cheating" multiple versions of the test were created where questions varied slightly in regards to search terms, data field, type of databases, etc. Assessment scale was set for exceeds expectations (90-100%), meets expectations (70-89%), approaches expectations (60-69%), and not meeting expectations (0-59%).

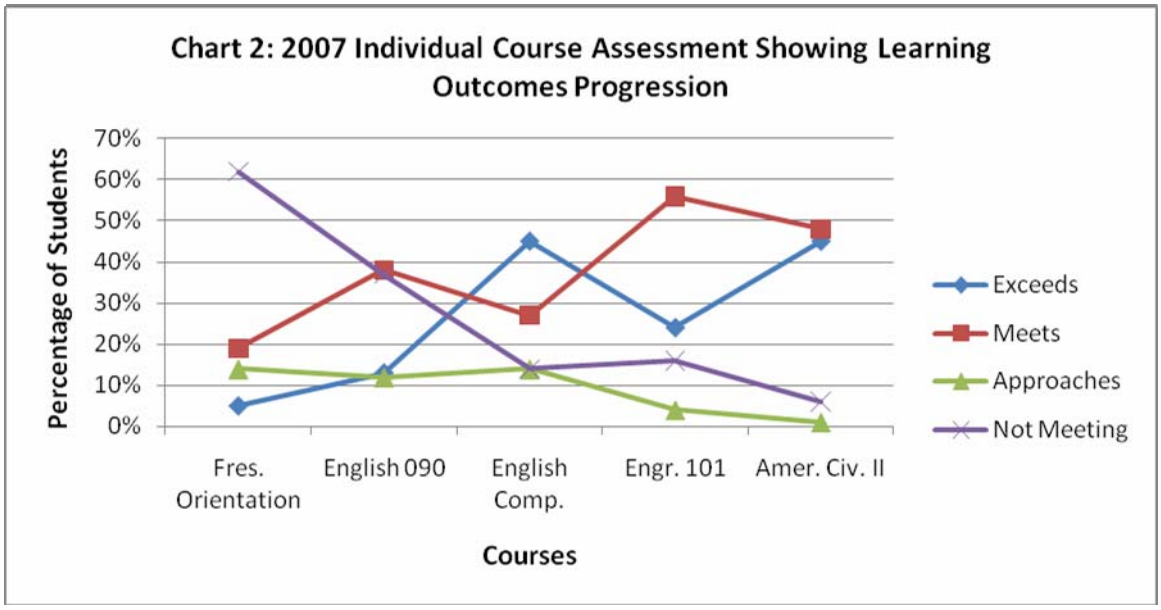
Methodology: The general education assessment required a minimal sampling of 25% student FTE. To achieve this sampling size information literacy sessions were conducted in several introductory and mid-level courses in English, History, Oceanography, Marine Biology, Engineering, and Meteorology. The standardized test was distributed to students at the end of each session with a given due time of one week for completion. When completed, the tests were reviewed, graded, and assessed by librarians and the results forwarded to instructors for extra credits. The arrangement of giving extra credit for the assignments demonstrated to students the serious nature of the assignment and encouraged them to learn the information literacy concepts Williams et al (2004).

Findings: Data for 2004 and 2007 general education assessment for information literacy learning outcomes is shown in chart 1.



In comparing 2004 vs. 2007, data for 2007 shows an increase in number of students who meet and exceed expectations and likewise a decrease in number of students who approach and not meet expectations. An interesting observation, however, is that in 2007 more students were not meeting expectations as indicated by the triple percentage increase of 17% vs. 5% in 2004. Though the results were encouraging and showed some program success, there was a clear indication for the need for continued focus on information literacy instruction to develop skills of students not meeting and approaching expectations.

A closer in-depth look at 2007 data showed a progressive trend of student information literacy skills development at increasing levels of academic studies. Chart 2 displays the data trend for five courses taken at different levels of studies, from first semester freshman orientation to second semester Engineering 101 to fourth semester American Civilization II. The trend is upward, indicating that students developed their information literacy skills over time as they progressed in their studies.



5. Continuing Assessment - A More Sustained Effort

After the 2007 cycle of general education assessment, the Library decided to continue information literacy assessment on an annual basis. In 2008, assessment of student learning outcomes for the Library instruction program was repeated. Prior assessment process and results were used to improve the Library instruction program as well as revise the assessment process itself. This is termed "Closing the Loop" as defined by SUNY's General Education Assessment Review Group (SUNY's GEAR Group). For an initial effort at "Closing the Loop", a new process using a pre-test tool was added to the Library instruction program assessment methodology. This revised methodology, complete with pre-test and post-test activities, provided key data to assess effectiveness of Library instruction techniques i.e. how well are students learning research skills given the Library instruction received.

Revised Methodology: Addition of the pre-test activity to the already existing post-test activity formed the basis for the revised methodology. The underlining process is to compare information literacy skills of incoming freshmen without providing any library instruction to the skills acquired by these freshmen after experiencing a library instruction session. The measuring instrument remained the same, a four-category 16-question standardized test. This test was distributed to all freshmen in LEAD 101 (the freshmen orientation course) as a pre-test and was then repeated in other freshman courses such as English and History as a post-test. Carter (2002) discusses a related methodology at the Citadel where a pre-test was administered during freshman orientation and a post-test administered during upper level courses. For the Library instruction program, administering the pre and post-test in separate courses was done purposely in order to minimize skewed results. As Emmett and Emde (2007) discusses, when administering identical pre and post-test students are prepared for the post-test by the pre-test itself, especially when the tests are give within a time frame of minutes or hours apart.

Findings: Pre-test and post-test learning outcomes data are shown in chart 3. As anticipated, the results show almost a reverse in skill levels from pre-test to post-test. Only 34% of incoming freshmen meet or exceed expectations but after taking a Library instruction session and completing the post-test this jumped to 81%.

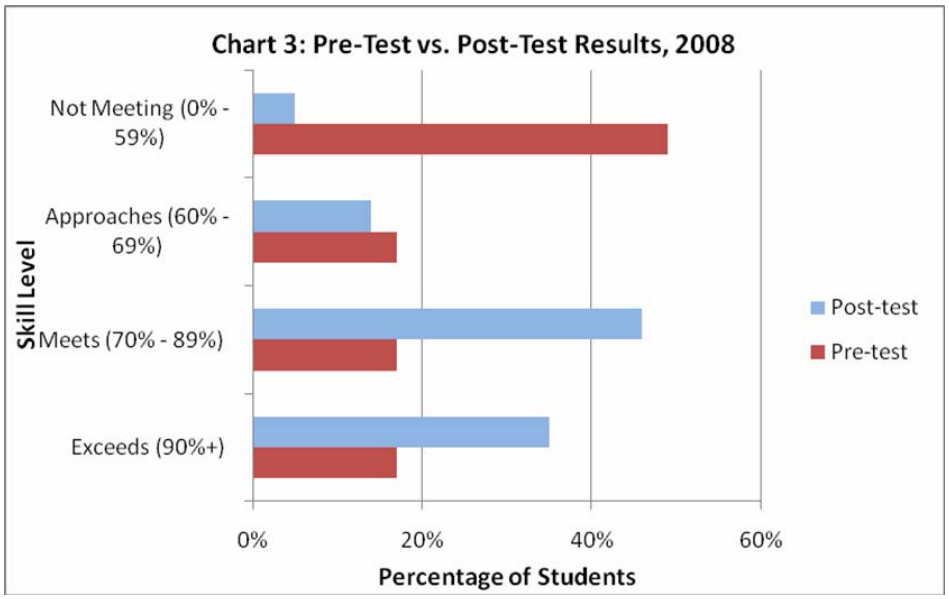
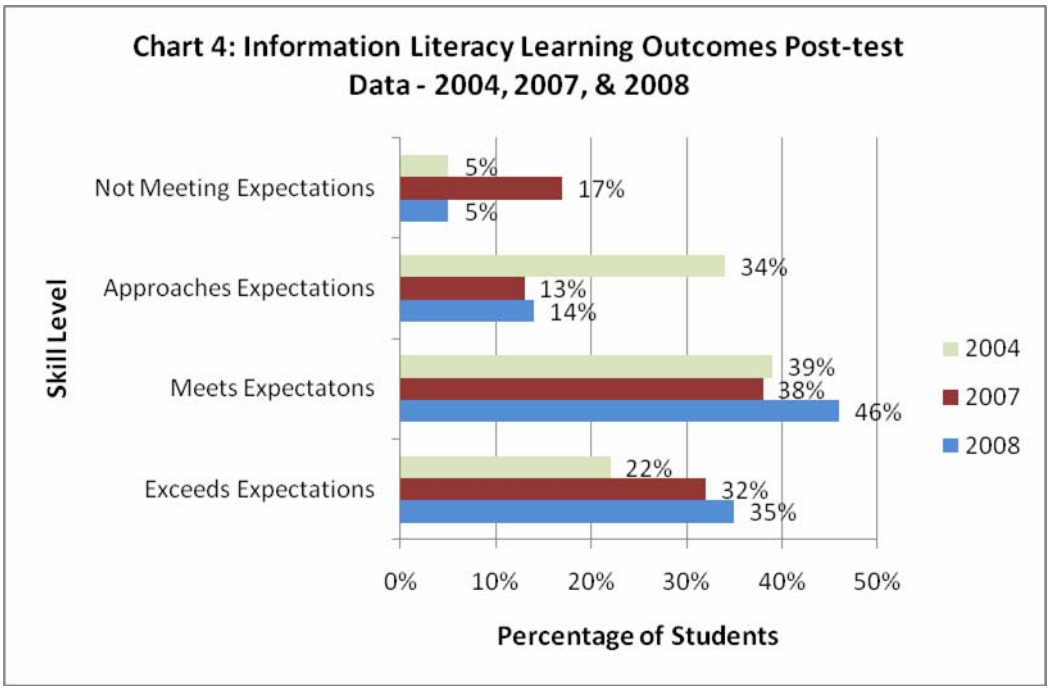
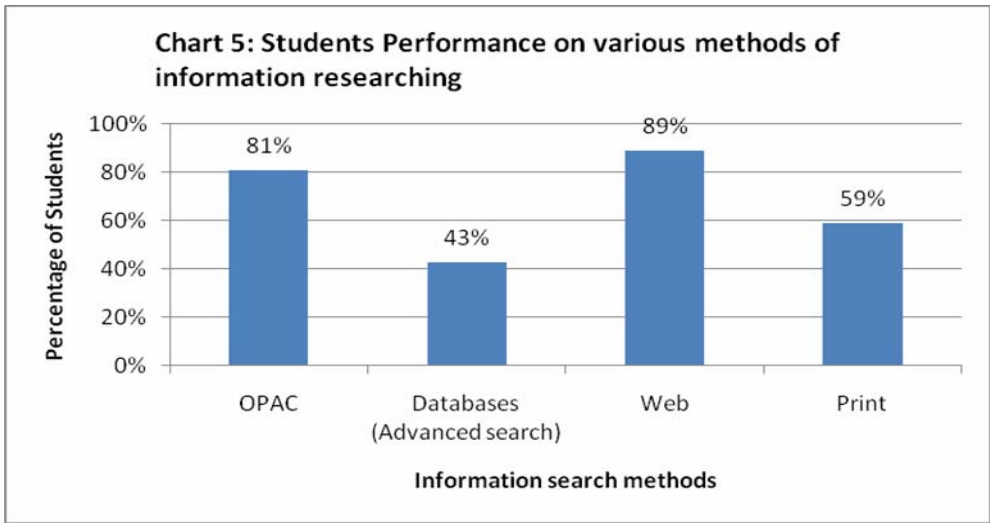


Chart 4 compares the three sets of learning outcomes post-test data for the years 2004, 2007, and 2008. In 2008, the data shows a decrease in number of poor performing students as indicated with a total of 19% of students not meeting or approaching expectations. This value is compared favorably against 30% in 2007 and 39% in 2004.



The 2008 data was further analyzed to get an indication of strengths and weaknesses in students' specific researching skills. Chart 5 shows students' performance analysis on the four categories of questions on the standardized test - searching the OPAC, basic and advanced searching in periodicals databases, locating and evaluating web sources, and locating print sources. As the analysis revealed, two areas students are having difficulty with are conducting the more advanced type searches in periodical databases and using print bibliographic sources to locate information . This analysis is very useful in determining how to revise the Library's information literacy lesson plans to focus on developing problem areas.



6. Conclusion and Future Directions

Integrating information literacy in the maritime curriculum is critical to developing students' lifelong learning skills. Assessing student learning outcomes to determine the efficacy of information literacy programs is not only important for revising and improving the program but also to meet standards mandated by accrediting bodies. This paper illustrates the assessment activities undertaken by the Stephen B. Luce Library Instruction Program at SUNY Maritime College. As the Library instruction program focuses on integrating effective information literacy into the maritime curriculum, assessment of the program provides a quantitative means of documenting progress towards the College's education goals. Three sets of assessment data, from 2004 to present, have clearly indicate that the Library's instruction program is effective and is moving in the right direction to continue graduating lifelong learners in the maritime industry.

In looking ahead, the Library will continue to modify and expand the information literacy assessment process to generate higher quality and more descriptive data. A few modifications and enhancements have already been identified for implementation in the near future. First, an increased level of librarian – teaching faculty collaboration will improve assessment on how well students can synthesize information to write research papers. Librarians will continue to collaborate with teaching faculty on syllabi analysis and integrating information literacy sessions in the classroom. However, this collaborative effort will go a step further where librarians will work closely with teaching faculty to assess how well students integrate information into their research papers. Second, implementing a post post-test process will generate key data as to how well students are retaining information literacy skills acquired in earlier courses. This simple process will involve administering the information literacy standardized test to students in a senior level course without providing any library instruction. This process will not only generate data on how well students retain information literacy skills developed in earlier courses but also provide valuable feedback on how well students are prepared to be lifelong learners.

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Perfect Rescue and Humanism: A Large Vessel Broke into in the Stormy Seas

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Abstract

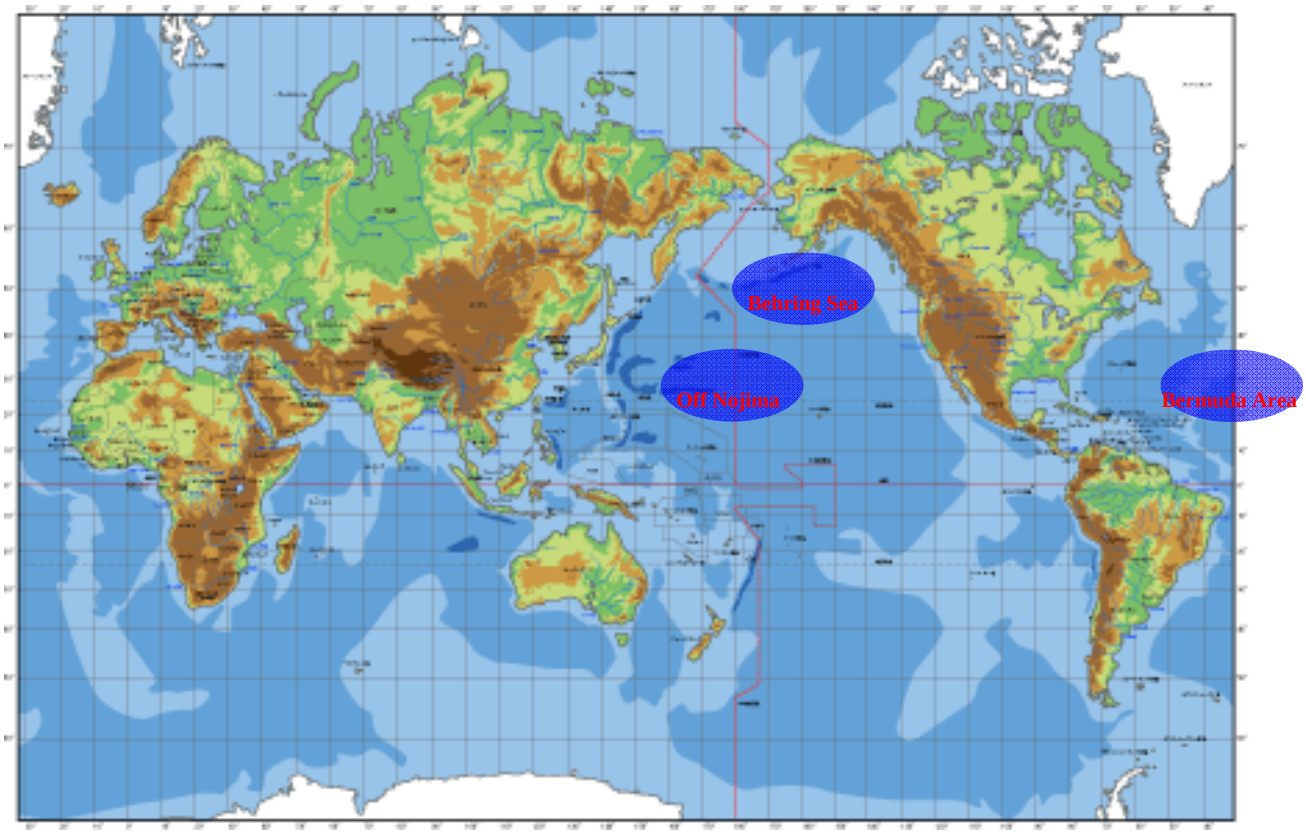
1. Prologue

At the yearend of 1980, a large iron ore carrier, the Dampier Maru with 50,000 gross tonnages was navigating from Chili to Japan. In the course of its route, about 1,000 kilo meters east-southeast of Nojimasaki Japan in the North Pacific Ocean was known and terrified for its treacherous waters as Devil's Seas in winter. The seas became very rough besides the strong low pressures arose and went across the North Pacific Ocean one after another. When the Dampier Maru reached the perilous seas, two cargo vessels had been wrecked consecutively on the same day in the same part of the ocean. In such circumstances, the Dampier Maru received an SOS signal from another vessel the Onomichi Maru which was also sailing in the vicinity of the Dampier Maru.

1.1 Information

1.1.1 One of the worst three notorious Devil's Seas in the world

The Bermuda Triangle, Bering Sea, and a part of the North Pacific Ocean between 300kilo meters and 5,000 kilo meters off Nojimasaki, Japan at the latitude of 35degrees N.



1.1.2 Maritime disasters happened in the Devil's Seas

(1) In January, 1969

Japanese large iron ore carrier the Bolivar Maru with 33,000 gross tonnages sank breaking in two. 31 persons died.

(2)In February, 1970

Japanese large cargo vessel the California Maru with 34,000 gross tonnages sank breaking in two. 5 persons died.

(3) On December 28, 1980

Yugoslavian cargo vessel the Donau was lost after the last wireless report saying "flooding from bow".

(4) On December 28, 1980

Liberian cargo vessel the Artemis took on a large amount of water and could no longer navigate.

(5) On December 29, 1980

Indonesian cargo vessel the Garza tear sank. 18 persons were rescued. 6 persons were missing.

(6) January 2, 1981

Greece cargo vessel the Anti Palos was lost.

As mentioned above, a total of 18 large vessels had already sunk and more than 150 persons died by then in the Devil's Seas. Especially only within such a short period as 6days between Dec.28, 1980 and Jan. 2, 1981, 4 large vessels had been lost. Under such a circumstance, distressed vessel the Onomichi Maru was rescued by the Dampier Maru.

1.1.3 Characteristics of both vessels the Dampier Maru and the Onomichi Maru

Rescue vessel: The Dampier Maru GRT: 50,451t The number of crew: 25 persons LOA: 250m Breath: 39m Cargo: iron ore/88,810 M/T Route: from South America to Japan	Distressed vessel: The Onomichi Maru GRT: 33,833t The number of crew: 29 persons LOA: 218m Breath: 31.7m Cargo: coal dust/53,900M/T Route: from East coast of North America to Japan

1.1.4 Large vessel

A vessel with 50,000 gross tonnages which used to be a large vessel at that time doesn't belong to a large vessel any more. But please allow me to mention the Dampier Maru or the Onomichi Maru as a large vessel.

1.2 Determination of the captain who rescued the vessel

At that time, the rescue vessel the Dampier Maru herself might also have lost in terrible stormy weather. Therefore, I could have chosen not to rescue the distressed vessel even if I received a SOS signal because I had heavy responsibilities on my vessel, human life, safety of cargo and charterer's damage. Probable risk if the Dampier Maru proceeds to its rescue.

(1) The risk of collision would be very high, if two large vessels get close to each other in very rough sea.

(2) It was estimated that each day's delay would cost about 2.5 million yen.

But when I noted that the Onomichi Maru, a large vessel at that time, was one of the vessels with a lack of strength of the hull which had been built around 1965, I determined to go to rescue the distressed vessel. Moreover, 20 years had already passed since it was built. I thought "the most important thing is to save human life of 29 crew of the vessel. I will save the ship's entire crew." Then I decided to go to its rescue.

1.3 Approach to the rescue for all seafarer's life

At 3:00 p.m. on December 30, 1980

According to the first wireless message from the Onomichi Maru, the part between No.1 and No.2 hatch was almost broken apart. In addition to this, the bow was tilting up and down. Under the circumstance, the most important thing was to calm down the crew of the distressed vessel. Therefore I spoke to the captain of the Onomichi Maru slowly and calmly confirming previous port, destination, cargo, the name of captain and the numbers of crew.
Simultaneously, radio officer contacted the 3rd region of Japan Coast Guard.

At 4:26 p.m.

I made a radio contact to the Onomichi Maru again, and then I noted the Onomichi Maru's bow was completely broken apart and gone. The damaged vessel made an urgent request for her rescue. During that time, the Onomichi Maru's crew were struck with terror of death in such situation that the ship was about to sink at any moment. The crew were in panic. They considered that abandoning the vessel should be done before getting dark. If a reckless attempt of abandoning the vessel in the high waves was carried out, disastrous outcome would be inevitable. In order not to let that happen, I told the captain of the Onomichi Maru "Since it takes much time for water to penetrate coal dust, the ship is sure to stay afloat for a while. Even though the bow had been already lost, the ship wouldn't sink immediately." Moreover, I asked some questions about conditions of trim and heel. Through this wireless communication, they came to understand the ship stayed afloat and upright. The winds were still powerful, blowing the maximum instantaneous wind speed of more than 25 meters per second.

At 6:36 P.M.

The Dampier Maru reached within 5 miles of the Onomichi Maru.

Around 7:30 p.m.

The Dampier Maru approached 0.5 miles away from the Onomichi Maru side by side.Taking a look at the Onomichi Maru through binoculars, the lifeboats reflected with deck lights had been swung out to the deck line. Some of crew with lifejacket and helmet were on deck. The Onomichi Maru looked upright. If the side of the vessel sank under the water, it was in danger of sink. But in this case, there was no problem. I suggested that it would be preferable to wait for dawn standing by rescue operation to start at any time. After a pause, the captain of the Onomichi Maru accepted my proposal.

1.4 The rescue system/Preparation for the rescue

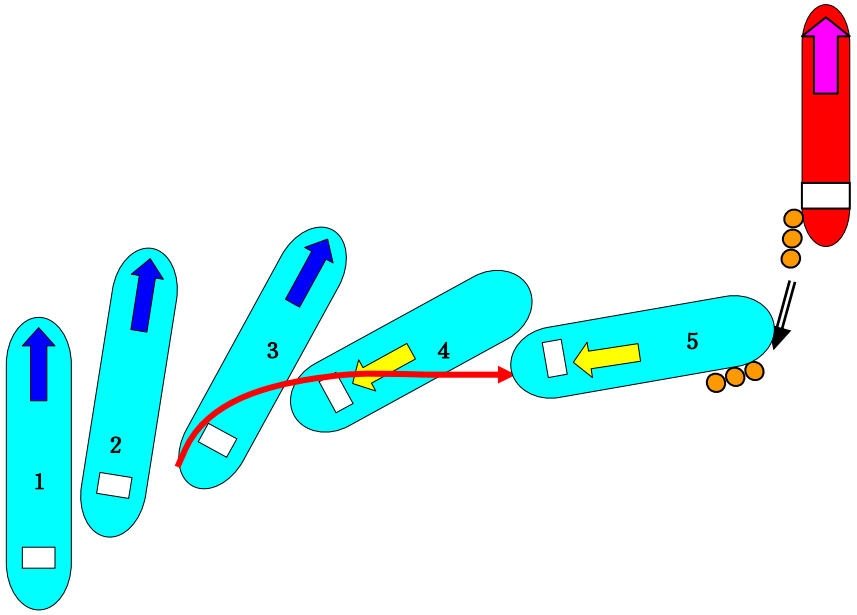
1.4.1 To the crew of the Dampier Maru

At first, all of the crew gathered and I expressed my resolution that we would save the entire crew without any sacrifice even a single individual. Every crew member entirely agreed with me. Fortunately some of them had experience with maritime crisis situations. I valued their opinions. Each of them devised concrete measures on preparation for rescue, procedure of rescue, following up after rescue, deployment, role of each person, and so on. Fruitful discussion to achieve mutual purpose made all 25 crew of the Dampier Maru unite in one mind.

1.4.2 The rescue plan

1.4.2.1 The plan of maneuvering

In those days, boat fall block should be removed from a lifeboat manually. Therefore if a hand attempt to remove a heavy iron block from the boat in unstable bobbing boat, the crew might suffer serious injuries. So I suggested the captain that it's better to abandon the ship by life raft instead of life boat. Ordinarily, the Dampier Maru would approach life raft to pike it up. But this time, I changed my experienced pattern in past to opposite way of thinking; that was the Dampier Maru would be positioned at the leeside of the Onomichi Maru and was waiting for life raft drifting to lee ward as the process in showing below.



①～③ Approaching from weather side at slow ahead observing the life raft on port bow.
④ Hard a starboard and full astern just before aligning the Dampier Maru' bow and life raft.
⑤ When the sign of astern engine came out to the side of the bridge, stern of the Dampier Maru would swing to left. It's easier to rescue because large vessel and life raft stuck each other.

1.4.2.2 The Onomichi Maru's abandoning plan

29 of the crew divided into 3 groups to get on 3 life rafts respectively.
And the crew must obey the rules as below.

(1) Only a piece of luggage including important documents should be brought out of the vessel.

(2) It would be forbidden to bring metal and personal belongings which might damage the raft.

(3) Every crew should wear cap instead of helmet which might damage the raft.

(4) Getting on the raft in seniority order.

2.1 Wait one more day for the rescue to start

2.1.1 Anxiety of the distressed people in the vessel

At 6:00 a.m. on December 31 (New Year's Eve)

Wind force and direction have not changed at all. Miss judging of the state of sea might bring the result in complete failure of the rescue operation. I suggested the start of the rescue operation should be put off until observing the proper situation. The captain of the Onomichi Maru agreed. He added, however, that they could wait for the rescue to start no later than noon. Some of the Onomichi Maru's crew such as captain, chief officer etc. understood that the ship wouldn't sink right away. But patience of the other crew members was almost giving out. I tried my best to relieve the crew again. I repeatedly communicated that "how dangerous if abandoning the vessel was conducted in the high waves. It would be a very high-risk from the rescue point of view, too." But if the crew of the Onomichi Maru began to evacuate the ship, we would have no choice to begin rescue operation, no matter how the sea condition was terrible.

2.1.2 The conviction of the captain of the Dampier Maru

At 6:00 a.m. December 31

I had a conviction that wind would be calming by the next day as a result of studying weather charts being faxed every 6 hours.

At 9:40 a.m.

As time went by, the crew were unable to control themselves. So I tried approaching the Onomichi Maru to make them understand how risky if they recklessly tried to evacuate the ship in a very rough sea. I took a chance to give the order to approach the damaged vessel. The Dampier Maru came up alongside the Onomichi Maru, until it was about 100 meters away. The crew of the Onomichi Maru were already waiting on the deck, wearing helmets

and orange life jackets. At just that moment, a huge wave from the starboard side swallowed the deck of the Dampier Maru. The large vessel was pitching and rolling heavily like a leaf. It became clear to everyone that if that kind of huge waves struck a life raft, no one could survive. Shortly after, a message came from the Onomichi Maru suggesting that they wait one more day. I was certain that now we'd be able to save everyone. And I was able to regain my calm from myself who unconsciously began to be impatient.

2.2 Turn to the rescue operation

2.2.1 Our challenge was about to begin

At 6:30 a.m. January 1, 1981

The winds and waves were calming. I thought our challenge was about to begin. I finally ordered to start the rescue operation.

At 7:00 a.m.

Confirming the Dampier Maru was approaching, three inflatable life rafts were lowered from the Onomichi Maru. But the captain of the Onomichi Maru remained on the bridge and insisted to go down with the ship. The chief Officer persuaded him into evacuating together with the other crew. But the captain refused it. After rescue operation, the captain of the Onomichi Maru said, "At that moment, the hearty voice of the captain of the Dampier Maru was coming from wireless. "We've already made preparations to celebrate the New Year day together with all of you, I'm praying for your safe evacuation." Hearing these words, the captain of the Onomichi Maru said he was able to change his mind and chose to evacuate the ship and go on living. Just before a squall fell over, all of the Onomichi Maru crew safely went on board the three life rafts.

2.2.2 Life rafts were unable to get away from the Onomichi Maru

The life rafts were supposed to drift leeward toward the Dampier Maru, but unexpectedly, they remained pressed up against the side of the Onomichi Maru. They couldn't get away from the Onomichi Maru, because the ship and the rafts were drifting to the same direction. The ship was moving faster than the life rafts that became heavier packed with crew.

2.2.3 Life rafts began to drift in the opposite direction unexpectedly. Keep a sharp lookout!

Eventually the life rafts cleared the stern of the Onomichi Maru, but they were getting farther and farther away from the Dampier Maru in spite of wind direction. I gave orders to bring the Dampier Maru over to the windward side of the life rafts.

2.2.4 Be sure to attach the safety ropes to yourselves!

At 8:30 a.m.

Three life rafts almost arrived on the port side of the Dampier Maru. The procedure of climbing aboard the Dampier Maru from the rafts was as follows. The Onomichi Maru crew put a rope with loop around their bodies. With a help of the Dampier Maru crew hauling up them, they would climb up along a life net. The procedure had been already notified to the crew of the Onomichi Maru.

But the first crew suddenly leapt onto the net without the safety rope which was supposed to be attached. He began to climb. It was 5.5 meters from the sea surface to Dampier Maru deck. The crewman was struggling to climb the net only with his physical strength alone. After he managed to reached to the deck, he burned himself out, unable to move.

Accidents happen when people don't obey the rules. Following the rules is the most important factor for preventing accidents. Hauling away a grown-up was a very hard work especially in high waves of three meters.

2.2.5 Look at the sharks!

Sharks began to swarm around the Dampier Maru attracted to discharged garbage from the Dampier Maru. Another danger could possibly happen. The rescue operation still continued.

2.2.6 Another squall arose. Should we suspend the rescue

Suddenly another squall came into being. Fierce winds over 18meters per second began to blow and the rain bucketed down. I said to the chief officer, on scene commander "Why don't we suspend the rescue work until the squall is gone?" he responded with full of confidence "It's no problem. Please give us a permission to continue to do it." The energetic atmosphere and enthusiasm of those on the front lines provides the driving force for success. I thought no accident would occur. Finally I gave him permission.

At 8:45 a.m.

All 29 crew members of the Onomichi Maru were rescued. It took only 15 minutes to bring all crew onto the Dampier Maru from the life rafts. Forty-two hours had passed since the Dampier Maru had received the SOS signal from the Onomichi Maru.

The Captain of the Onomichi Maru came up to the bridge of the Dampier Maru. In tears, he exclaimed his gratitude again and again "Thank you very much! Thank you very much!" Then He hugged me hard "If even one life had been lost, I couldn't have lived longer. Thank you!" In my heart I was speaking to the captain of the Onomichi Maru: "I know how much

agony you were going through before you abandon the ship. How painful when you had no choice to let your ship go. You must be very distressed."

Crew of the Dampier Maru worked speedily holding slogan "Entertain the most those who went through the roughest period." Especially four stewards led by chief steward played an important role to show crew of the Onomichi Maru to the bath in order to warm their chilled bodies and passed them fresh underwear and other garments provided by crew of the Dampier Maru.

2.2.7 Let's celebrate the New Year day all together

At 10:00a.m.

After bathing, the crew of the Onomichi Maru were shown to the saloon, welcomed by a luxurious New Year's meal spread out before them.

3.1 The essence of the rescue operation

3.1.1 Unity

Usually the numbers of crew were 35 to 40 on the Dampier Maru. But there were only 25 crew members on board in this voyage. Therefore in order for them to summon up their abilities as much as possible, I tried to create the atmosphere that every crew member was willing to accomplish more task than ever with stronger sense of responsibility. Moreover I prayed day after day their safety, well-being and great success on their job.

To be able to save entire crew, following points were remarkably important.

1) Only a captain couldn't have done any of the rescue operation alone. The joint effort of every crew member working single-mindedly, in a life-or-death struggle led the rescue successfully. I was extremely grateful to those who cooperated with me and wished to hug each of them.

2) The most important factors were maintaining good friendship among crew members as well as well communicated atmosphere among leaders of each department.

3) All 25 crew members on the Dampier Maru were strongly united in their resolve to save the entire crew of the Onomichi Maru. Some of them, who had experience with maritime crisis situations devised and offered many concrete measures that made me, as the captain of the Dampier Maru, give easier the order properly.

3.1.2 Practical aspect

As a result of flexible way of thinking, dealing with difficult situations on an ad hoc basis, such as, launching life raft instead of life boat, the rescue was done without fail.

Following points were remarkably important from the view point of practical aspect.

1) The theme of my graduation thesis at Maritime Technical College was the mechanism of sinking of a ship. According to this study, I was sure that the Onomichi Maru carrying coal dust remained afloat for a while. Indeed, it remained afloat for about 40 days after the accident.
2) The successful rescue of the crew of the Onomichi Maru depended on when the high waves would cease and whether the crew could remain calm in a situation that the ship might sink at any moment. Considering this point, as the captain of the Dampier Maru, I was able to lead the successful rescue.
3) Facing to any difficulty, people naturally make careful plans with refinement if those who are serious about discharging their responsibilities. Rough, impractical planning is a token of a lack of sense of responsibility for success. The rescue plan and deployment that the entire crew of the Dampier Maru devised with all their might were the leading factors for the great success of this time rescue.

3.1.3 The mental strength that supports captain's decision making

As the captain of the Dampier Maru who bore full responsibility and was forced to make a fatal decision alone in critical situation, how I was able to keep my mental strength.

The first, according to Buddhism philosophy, everyone possesses inherently infinite wisdom and courage. I was firmly certain it's possible to overcome difficult situation if I had serious consideration and putting it into practice.

The second, I have a mentor of my life to lead me with. My mentor is SGI President, Ikeda Sensei. Through his guidance, I have been learning uncountable things. Among them, SGI president, Daisaku Ikeda, showed us his humanitarian behavior based on Buddhism Philosophy by saying, "Treasure most those who went through the roughest period!" The heart of taking good care of others like treating treasure is the essence of humanism.

The third, Words of encouragement enabled me to overcome difficult situations.
Nothing is more grateful than words of encouragement by crew like my old friends. It pushed me to order the right decision in such critical situation. Encouragement is a source of courage.

As above, 42 hour rescue drama was over. All 29 crew members of the Onomichi Maru were rescued successfully. Especially captain of the Onomichi Maru had chosen to "abandon" the ship in order to "stay alive". His resolve and courage deserve to be praised. Anyone must not easily choose death. The genuine brilliance as human being shines when we make an effort to go on living vigorously, no matter what difficulties we encounter.

3.2 Epilogue

This thesis was written by not only myself but also together with several Hato-kai members. We reviewed and reflected my experience. So the first person, "I" includes several different perspectives. I would like readers to understand this point.

From our view point, 'Perfect Rescue and Humanism' was named as a title of this paper. Humanism means always cherishing each single individual and the value of human life. The rescue drama succeeded by unknown Japanese seafarers in the North Pacific Ocean resulted in complete success because of humanism in action. And finally, we would like to conclude this paper confirming that only when putting the idea into practice, humanism exists brilliantly. Thank you very much.

References: role of each crew of the Dampier Maru

Bridge	Radio office	Engine room	On deck
Captain (general command) Second officer (sub command) Third officer (telegraph, record) Quarter master Second radio officer (liaison with rescue team on deck)	Chief radio officer (commentary to Japan coast guard in Yokohama)	First engineer (M/E operation) Second engineer Oiler (concentrate on abnormality of instruments, engine sound)	Chief officer (on-scene command) Chief engineer (photograph) Third engineer (throwing life buoy) Boatswain Quarter master No.1 oiler Oiler wiper
5 persons	1 person	3 persons	12 persons

Other than above, 4 stewards led by chief steward took care of crew of the Onomichi Maru when they were successfully on board.

Creating a Simplified User Manual for ECDIS Training

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Abstract

This paper focuses on the need to have a simple user manual for the purpose of ECDIS (electronic chart display and information systems) training as ECDIS equipment will soon become mandatory on seagoing merchant vessels. This is so because at present user manuals prepared by equipment manufacturers are cumbersome and difficult to follow as they run into Several pages.For the purpose of ECDIS training I have developed a simplified user manual that ensures that competencies required to be demonstrated as per the IMO model course 1.27 (The operational use of electronic chart display and information systems) are clearly explained and made easy for the user to follow. This will ensure that keeping officers it easy to become competent in the functions that they require to master as per the IMO model course for safe navigation and collision avoidance. The manual has been so designed that it can be used with any type of ECDIS training and/or shipboard equipment, this would mean that it is not equipment specific.

The manual has been developed using screen shots of key tasks with explanation and pointers on how to perform them in a simple and logical manner. An explanation on the relevance of the task in relation to safe navigation and/or collision avoidance has also been provided. A copy of the developed manual will be given to all conference delegates.

1. Introduction

The Electronic Chart Display and Information System (ECDIS) will become mandatory equipment for all ships by the year 2018. In this regard officers in charge of a navigational watch must be trained well so that they can navigate the vessel safely in all waters using an ECDIS. To navigate safely, navigating officers would need to familiarize themselves with ECDIS equipment on the ships that they sail on, and demonstrate that they are confident and knowledgeable in operating an ECDIS on board. A simplified user manual I feel will not only enhance competence levels but would also make learning easier and therefore more efficient.

2. Problem Definition

The International Maritime Organisation has developed a model course IMO 1.27 (The operational use of electronic chart display and information systems) to help flag states train their seafarers in the use of the ECDIS. The model course is designed to be completed in 5 days and details, learning objectives that an officer must achieve to be competent in the use of the ECDIS. Some of the course objectives require the mariner to demonstrate competence. This is especially so in the navigational functions of route monitoring and route planning.

In this regard the model course could be made more effective if a simplified user manual is attached with it. The manual will be designed to explain the required learning objectives that the ECDIS user must know to help him navigate the vessel in a safe manner.

The developed manual can be used to supplement the user manual supplied by the ECDIS equipment manufacturer as it will help the navigator understand the basic principles of ECDIS operation. This I feel is required as most ECDIS user manuals are lengthy. The principles and the theory behind an ECDIS have been explained in several books that are there in the market today, but these books do not co-relate with the technical user manual supplied by the ECDIS manufacturer. The developed manual will overcome this shortcoming too.

An example in this regard are the several simplified user manuals that have been developed for common multimedia applications that are used by non IT professionals. Adobe systems provides simplified user manuals for their suite of multimedia software programmes like Adobe Illustrator, Adobe Photoshop etc. These have been developed in addition to the manuals that are normally used by IT professionals.

The manual developed has followed the example of simplified training manuals written by multimedia companies for the common man. A simplified user manual for ECDIS familiarization would therefore compliment the ones provided for by the manufacturer, enabling the mariner to be familiar and competent with the common navigation and collision avoidance planning and monitoring tasks on an ECDIS in a short time. It would also help the facilitator, facilitate the training in the operational use of the ECDIS in a more efficient manner.

3. The User Manual

The manual has been developed with the learning objectives of the IMO model course 1.27 as a guide. In this regard the manual incorporates screen shots and explanations of all the tasks that user should be able to perform for safe navigation and collision avoidance as required by this course.

The manual has been designed with the facilitator in mind. This is because the role of the facilitator is crucial in a learning process (Feith 2008).

As the manual incorporates the detailed teaching syllabus of The IMO model course – each learning objective has been explained in detail with diagrammatic illustrations provided wherever required to enhance text.

Sequential screen shots have been provided for objectives that require the user to demonstrate competence. Bulleted text has been used to ensure that the steps required to achieve a required task on ECDIS has been shown logically and sequentially.

Operational steps in the use of the ECDIS are based on the Transas Marine ECDIS. This is because it is the logic behind the step that is important and not the steps per se. In this regard if the user understands the logic behind an operational task of the Transas ECDIS he would also understand the logic of the same operational task in another manufacturer's equipment.

4. User profile

Users are seafarers who will use the manual to understand the operational principles of the ECDIS equipment and therefore be able to perform tasks on the ECDIS for safe navigation and collision avoidance in a competent manner. Trainers could use the manual to help facilitate mandatory ECDIS training.

5. Writing the Manual

The IMO model course 1.27 has been used as the guide to write the manual. The manual has 17 chapters, based on the general learning objectives of the model course. The chapters of the manual are as follows:

Chapter 1 – Legal Aspects and requirements of ECDIS. This chapter deals with ECDIS performance standards, carriage requirements and data procurement responsibilities.

Chapter 2 – Principal types of Electronic charts. This chapter deals with the differences between ECS and ECDIS systems and between raster and vector charts.

Chapter 3 – ECDIS data – this chapter outlines the steps in the creation of an ENC chart, the data structure of an ENC chart, referencing systems for positioning and other navigational functions and the organization of chart distribution among others.

Chapter 4 – Presentation of ECDIS data – this chapter explains the various presentation rules of an ECDIS, the ECDIS display categories and the different modes of presentation.

Chapter 5 – Sensors – the chapter highlights the various sensor inputs provided for in an ECDIS, their limitations and integrity.

Chapter 6 – Basic Navigational functions and settings – After reading this chapter the user will be able to demonstrate competence on how to use the basic navigational functions of an ECDIS display like, using the variable range marker and the electronic bearing marker,

setting the safety contour, monitoring key navigational parameters, saving and entering mariners notes and using the pick report.

Chapter 7 – Specific functions for route planning – The user will be able to demonstrate competence in planning and constructing a safe passage using the ECDIS from a known departure point to an arrival point after reading this chapter.

Chapter 8 – Specific functions for route monitoring – After reading this chapter the user will be able to call up saved routes as required, monitor these routes on passage by setting and checking the various alarms available on an ECDIS.

Chapter 9 – Updating – After reading this chapter the mariner will understand the importance of updating and will be able to demonstrate how to update an ENC or a raster chart. He will also understand how manual updates are done.

Chapter 10 – Display and function of other navigational information – Highlights the principles of layers of an ECDIS display, and how a radar image can be overlaid on the ECDIS and the effects of a radar overlay. The chapter demonstrates how the automatic track keeping mode is employed on an ECDIS.

Chapter 11 – Errors of displayed data – This chapter highlights the reasons for errors in data that is displayed on an ECDIS and how a mariner should check for these errors.

Chapter 12 – Errors of Interpretation – Recognition of errors are important for safe navigation and collision avoidance, this chapter deals with interpretation errors.

Chapter 13 – Status indications – The chapter explains the various alarms and indicators that can be activated on an ECDIS display and their significance.

Chapter 14 – Documentation – This chapter describes the voyage recording functions of an ECDIS.

Chapter 15 – Integrity monitoring – This chapter describes how a mariner can check the proper functioning of the ECDIS.

Chapter 16 – Back – up – The chapter highlights back up requirements for an ECDIS system.

Chapter 17 – Over reliance on ECDIS – The chapter highlights the dangers of being over reliant on the ECDIS and the precautions that need to be taken to prevent it.

Material for the manual was taken from Transas's user manuals and from recognized ECDIS textbooks that have been written for the Mariner. The text books are 'The Electronic Chart' by Horst Hecht et al, and 'ECDIS and positioning' by Dr Andy Norris.

Screen shots of the logical sequential steps to be used in completing an ECDIS task were taken on a Transas ECDIS while I was on attachment with the company in Singapore. Material was also taken from the several user manuals that were provided to me by Transas.

6. Conclusion

The developed user manual I feel will complement the IMO model course and will help standardize training the world over as all the learning objectives have been explained in a systematic manner. A disc provided for with the manual has slide shows illustrating how key tasks are performed on the Transas ECDIS in a systematic and logical manner. This not only makes learning easier but also makes it more efficient as the facilitator can use the disc and project it on a screen in a media classroom to explain key tasks. Even though these tasks are as those as performed on the Transas ECDIS – the steps will be logically similar for the same task on another manufacturers equipment.

The manual would also make the learning objectives easier to understand for both the learner and the facilitator. This is because the model course only states what the objective is but may not be very clear on the desired outcomes of a learning objective – by explaining the objective in detail a facilitator would know exactly what he has to teach. Nothing will be left out that is required to ensure the mariner has developed the required skills for safe navigation and collision avoidance. This is especially important as demonstrating safe navigation principles and guidelines I feel determine the success of an ECDIS course.

Finally I would like to emphasize that the user manual was designed and developed with the facilitator in mind as his role is crucial in any learning experience.

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Copyright Statement

Authors Biography

Ashok Mulloth is a Senior Lecturer with the Singapore Maritime Academy and has an Extra Masters Certificate of Competency, an Advanced Diploma in Multimedia Development and a Certificate in Internetworking & Communications. He has been with the Academy for over 16 years.

He has been an unrestricted Pilot at Port Klang, Malaysia and in Yanbu, Saudi Arabia. In this capacity he has handled all kinds of vessels including ULCCs and VLCCs in restricted waters. He has also been a Dock Master with Sabah Shipyard.

He has over 18 years teaching experience, gathered, as Cadet Instruction Officer with 'V' ships, and as a Lecturer with Akademi Laut Malaysia and Singapore Maritime Academy. He has taught various nautical subjects at Class 1, 2 and 3 levels (Deck). He has presented papers at IMLA 17 Accra, Ghana, ISATE 2008, Kumamoto, IMLA 15, Trinidad & Tobago, MARSIM 2006, Terschelling, SNI/NI Command Conference (2005), Singapore and at MARTECH 2002 and MARTECH 2006, Singapore.

Electronic Access to Library Resources Onboard the Training Ship Empire State VI: Enhancing the Learning Experience of Cadets at Sea

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Abstract

The paper "Electronic Access to Library Resources onboard the Training Ship Empire State VI: Enhancing the Learning Experience of Cadets at Sea" demonstrates how new technologies on the ship's library information systems support the maritime courses taught at sea. SUNY Maritime College prepares students for careers through a content-centered curriculum and a hands-on, team building approach to learning. As a part of the STCW requirements, the SUNY Maritime Cadets are required to participate on Summer Sea terms aboard the Training Ship Empire State VI, the largest training ship in the United States used for cadet training. The training ship is fitted with classroom space, computer rooms and a fully functioning research facility with access to the library's information systems and electronic resources. Similar to Maritime College Library ashore, the Ship's research facility is equipped with the appropriate technology to accommodate cadets' mode of learning and information research.

The Training Ship Empire State VI Library is equipped with several computer workstations networked on its local area network. The Library's systems are connected with the Ship's intranet and the Ship's satellite communication system to provide access to the library's digital resources. All library computers aboard the training ship, provide access to electronic publications, data banks, various training software and an automated integrated library management system. In addition, the paper demonstrates how a successful library support enhances the maritime student education at sea through the most effective mean of information technology.

1. Introduction

Maritime College is one of the 64 colleges and universities of the Sate University of New York System (SUNY) and one of the six Maritime Academies in the United States

granting United States Coast Guard licenses. SUNY Maritime College offers a solid academic program coupled with a structured cadet life in the regiment for both men and women. Maritime College prepares students for careers through a content-centered curriculum and a hands-on, team building approach to learning. The curriculum offers undergraduate and graduate degrees, and a European summer sea term of a 90-days aboard the Training Ship Empire State VI, SUNY Maritime [1].

The Maritime College Library, named after Admiral Stephen B. Luce, is accredited by professional organizations such as the Middle State Commission on Higher Education and it adheres to the standards and guidelines of the Association of the College and Research Libraries of the American Library Association, American Library Association [2]. The Luce Library collections, print and electronic, as well as the Library's instructional programs in information literacy, support the research requirements of the maritime disciplines in engineering, science, business, marine transportation, and the humanities.

As a part of the STCW requirements, the SUNY Maritime Cadets are required to participate on Summer Sea terms aboard the Training Ship Empire State VI, the largest training ship in the United States used for cadet training. The training ship is fitted with classroom space, computer rooms and a fully functioning research facility with access to the library's information systems and electronic resources. The paper "Electronic Access to Library Resources onboard the Training Ship Empire State VI: Enhancing the Learning Experience of Cadets at Sea" demonstrates how new technologies on the ship's library information systems support the maritime courses taught at sea.

Similar to Maritime College Library ashore, the Ship's research facility is equipped with the appropriate technology to accommodate cadets' mode of learning and information research. In addition, a faculty member of the library staff performs the duties of the Ship's Librarian. The Ship's Librarian, conducts research sessions on the information needs of all the shipboard community. The Luce Library afloat is the main resource and research facility for all cadets taking courses during the ninety-day summer sea term. In 1962, then Library Director Dr. Whitten set the standard of having a librarian sail aboard the Training Ship during summer sea term. Dr. Whitten stressed the importance of having a professional to provide reference and other library services. As Librarian Ray Cotter stated in the 1970 Librarian's Report, without the services of a librarian the Ship's Library is just a room full of bookshelves, Cotter [3].

2. Education Aboard The Training Ship Empire State VI

SUNY Maritime education and training continues at sea onboard the 565-foot training ship Empire State VI. The educational objectives of the summer sea term are, SUNY Maritime [4]:

(1) To provide an understanding of shipboard organization, administration, facilities and functions of the various departments of a merchant vessel.

(2) To develop a full appreciation of the principles of command, to train Cadets in the duties and responsibilities of watch officers and other supervisory personnel, and to promote a complete understanding of the duties and responsibilities of personnel in general.

(3) To supplement ashore classroom instruction in professional subjects through practical application aboard the training ship at sea.

(4) To promote an understanding, through practical experience, of the leadership, teamwork, techniques, and technical skills required to manage and operate a vessel efficiently, safely and economically.

(5) To enhance cultural and professional backgrounds through as many contacts with the geography, history, and national distinctions of other countries and peoples, as the limited time allows.

Cadets pursuing a professional license as a United States Merchant Marine Officer are required to take a minimum of three Summer Sea Terms. Cadets aiming to qualify as a mate undergo extensive (basic, intermediate, and advanced) training in ship operation and management. While onboard the "deckies" are exposed to rigorous training in the areas of communications, navigation, ship handling, ship operations, safety, and meteorology. Under the supervision of the Chief Engineer and the Senior Engineering Training Officer, Cadets qualifying as assistant engineers receive in-depth training in the ship's organization, interrelationship of the components of an operating engine room, and safety of person and ship. Each cadet must take and pass intensive oral and written examinations, SUNY Maritime College.

3. Stephen B. Luce Library Aboard The Training Ship Empire State VI

It has been a long tradition for the SUNY Maritime College to sail with its library during the summer sea term for three months aboard the Training Ship Empire State VI. Library records show that the Stephen B. Luce Library afloat has been in support of the education of the cadets at sea since at least since 1961. The Library aboard the school's Training Ship Empire State is staff with a professional librarian who is a member of the library faculty. The library is furnished with collections, services, electronic access to documents and databases and with a librarian with the professional knowledge and expertise to carry out the education mission of SUNY Maritime College.

In 1962, the Library Director, Dr. Joseph Whitten, joined the crew of the T. S. Empire State IV as the first Ship's Librarian. In his Librarian's Log he wrote: "It seems important that the Ship's personnel recognize the importance of reference, academic and advisory services. This end should be achieved, in part, through the presence of a professional librarian.

It certainly shows the interest of the Library in the total college program and should give all personnel that the Library participates in all aspect of the program," Whitten [5].

The Library on Training Ship Empire State VI is located on deck four and it occupies approximately 2500 square feet. It has a reading room with seating capacity for 55 people and shelving that holds approximately 7,000 books. Electronic resources are made accessible through several networked computer terminals. Similar to the SUNY Maritime College Library ashore, the Ship's Library is furnished with the latest technology to facilitate the teaching and learning objectives of the SUNY Maritime cadets at sea.

While at sea, the Ship's Library is heavily used by cadets, officers and the general crew and in recent years usage have increased even more. A decade ago the average use was about 2150 patrons over the nine-week sea term, but in recent years usage have doubled to about 4300 patrons for the term (averaging to 110 patrons per day). The Library opens an average of 12 hours a day while at sea and much less hours while at port due to many other scheduled port activities. The Library is staffed by the Librarian in charge and a few cadet assistants who perform routine maintenance and organization duties. The Librarian answers many reference questions including technical questions on ship operations, ship structure, ship handling, types of vessels and rules and regulations for each type, engine room techniques, engine design and peripheral components. Other reference requests are generally on information on vessels, travel and port information, currency exchange, food and culture, etc.

3.1 Library Technology Aboard

Technology is a major mode of learning for the new generation of cadets. Cadets are far more technology oriented and thus far more demanding for instantaneous access to information. The decision making process at sea is subject to instantaneous access to information; prime example is electronic navigation, electronic weather reports, electronic communication with other vessels and electronic access to important documents and resources.

Similar to Maritime College Library ashore, the Ship's Library afloat is equipped with the appropriate technology to accommodate cadets' mode of learning and information researching. The Ship's Library is furnished with several computer workstations networked on its local area network, (LAN).

The Library's LAN is networked to the Ship's intranet which is connected the Ship's satellite communication system. All library computers provide access to electronic publications, information on the Library operations and staff, image and data banks, various training software, and the Library's OPAC. Management of library operations is done using LibrarySoft, an integrated library management system. Cataloging of books, circulation,

patron record maintenance, statistics and report generation are all managed by LibrarySoft Constantinou & Fazal [6].

4. Access to Maritime Electronic Resources

The Ship's Library technology infrastructure is built on a local area network (LAN). Several computer workstations are networked to the Ship's intranet which is connected to the Ship's satellite communication system. Cadets and crew can access the electronic publications and research material through an image and data banks of various training software. The most updated editions of various official government publications are transferred in electronic format and made available on the library's computers. These publications are on subjects such as ocean conditions, navigations, federal regulations; and several sources on countries/cultures information and ports guide to support travelling to various ports of call. (Image 1.)

Image 1.

Cadets and crew have electronic access to titles such as Bowditch Practical Navigator, List of Lights, International Code of Signals, Code of Federal Regulations, Pilot Charts, Sailing Directions, Radio and Radar Navigation, and Sight Reduction Tables, Countries and their Cultures, CIA World Factbook, and Encyclopedia of Food and Cultures. Additionally, access to email enhances the delivery of electronic information to the Ship's Library. The email system is set up to work with the Ship's data satellite service. The Ship's Librarian

remains in constant communication with the librarians at the main library ashore. Whenever there is a need for access to additional electronic materials, the librarians are able to transmit the latest information via email to the ship's library.

4.1 Maritime Electronic Resources

Cadets studying navigation, use one of the leading reference works for marine navigation, the Bowditch Practical Navigator [7]. The electronic reference work encompasses thirty-eight chapters, on marine navigation, piloting, electronic and celestial navigation, navigation mathematics, navigation safety, oceanography and marine meteorology. The electronic format of the Bowditch Practical Navigator is the digital version of the print book which includes charts, drawings, and mathematical formulas as they appeared in the print version. The List of Lights is made available electronically by the Navigation Center of the United States Homeland Security, Coast Guard department [8]. The resource includes the most up-to-date information on the list of lights presented in a PDF format. Electronic access to the International Code of Signals, provides the cadets with an overview of the history of the international code of signals and a detailed list with colored pictures of all signal flags.

The Code of Federal Regulations, (CFR) is published by the United States Government Printing Office (GPO). The CFR is the codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the United States Federal Government, CFR [9]. The most popular sections of the CFR used by the cadets for their studies are CFR-50 **Wildlife and Fisheries; CFR-49 Transportation; CFR-46 Shipping; CFR-40 Protection of Environment, CFR- 35 Panama Canal, CFR-33 Navigation and Navigable Waters.** Pilot Charts, and Sailing Directions, provide electronic access to most up-to-date navigation charts. The Sight Reduction Tables, are used by all cadets for charting their course during navigation classes [10].

In addition to the course-specific electronic resources the cadets are required to use during their studies at sea, the library also makes other related non-course-specific resources available through its networked stations. During the ninety days at sea, the Training Ship Empire State VI visits five to six European ports. The SUNY Maritime College Cadets have the opportunity to be exposed to other countries, languages, customs, cultures and civilizations. Exposure to other countries customs and ethnic identities is a valuable lesson learned in an international discipline such as the maritime studies.

Electronic access to resources such as Countries and their Cultures [11], CIA World Factbook, [12], and Encyclopedia of Food and Cultures [13] provide invaluable information on other countries. Countries and their Cultures is a searchable database with images and maps with emphasis on the local and ethnic culture of each country. The CIA World Factbook, is published and made available by the Central Intelligence Agency of the United States government. It is one of the most comprehensive and current databases on factual

country information about the history, government, communication, transportation, population etc. The Encyclopedia of Food and Cultures is an electronic book format made available through the library's Gale databases subscriptions.

5. Conclusion

Library Director, Dr. Joseph Whitten, the first member of the faculty to serve as the Ship's Librarian in 1962 wrote in his librarian's log that ¼ of the schools maritime education takes place at sea. Cadets and young mariners receive their most valuable element of their education at sea, aboard ships where they apply their knowledge into practice and experience. Dr. Joseph Whitten's premise serves as the foundation for the Luce Library of SUNY Maritime College to build collections at sea, to develop services and to educate mariners in their natural element and the natural environment of their studies.

Traditionally and throughout history young mariners learned how to read and write and received their education from book they read at sea. Advancements in technology have revolutionized maritime studies in the areas of navigation, engineering and communication. All decisions made aboard vessels are based on access to information systems and technology. SUNY Maritime College educates and trains cadets to work under the most technologically advanced environments. The SUNY Maritime College Library aboard the Training Ship Empire State VI plays a critical role in providing the shipboard community with the most relevant up-to-date information. One of the most important objectives of educating mariners at sea is learning to appreciate and understand access to information as a critical component to decision making.

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Author's Biography

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Computer-Aided Engineering (CAE) Software: A Virtual Fabrication Workshop and Testing Laboratory

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Abstract

Computer-aided engineering (CAE) has been widely used in various fields of engineering and has been proven effective in performing simple to complex tasks. Its wide applications include design, manufacture, simulation, analysis, diagnosis and repair. With the interest in utilizing this technology in the field of marine engineering, a study was conducted to investigate the capabilities and benefits of using a CAE software to solve and analyze problems in related fundamental engineering subjects, including the validation of test results. SolidWorks®, a parasolid-based solid modeler which includes problem set-up, pre-processing, analysis solver and post-processing of results was used as the CAE software in the study.

A problem requiring stress analysis on a structural member, consisting of two portions of different widths connected by fillets subjected to tensile loading, was considered. Maximum stress at three fillet radius was examined and evaluated. The study process began with constructing 3D virtual models to virtual testing with the simulated load applied. Data obtained from the virtual tests were found to be in agreement with theoretical results. Maximum and minimum stress locations were also identified by the software by means of colorful graphics display. In addition, other valuable data necessary for analysis such as strain and displacement were automatically generated, including animation on how the test specimen responded to the applied load.

This paper presents the author's experience from virtual fabrication to virtual testing using the CAE software. Related marine engineering subjects, where the CAE software can be used, are also mentioned.

Key words: Computer-aided engineering (CAE), SolidWorks, virtual, stress analysis
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1. Introduction

The use of computer software to perform various tasks has become common in almost any field of engineering. Even educators employ software packages to support teaching concepts and practical aspects related to topics such as analysis, drafting and design (Raphael et al., 2003). In the field of marine engineering, besides engine simulators and computer-based training (CBT) softwares, the use of other computer softwares available, which could further enhance the teaching and learning experience in a traditional classroom environment, still has to be explored.

In this study, the capabilities and benefits of using a CAE software were investigated in solving and analyzing problems in related fundamental marine engineering subjects including the validation of test results. SolidWorks®, a parasolid-based solid modeler which includes problem set-up, pre-processing, analysis solver and post-processing of results was used as the CAE software.

2. Computer-Aided Engineering (CAE)

Computer-aided engineering is the use of computer software to solve engineering problems. With the improvement of graphics displays, engineering workstations and graphics standards, CAE has come to mean the computer solution of engineering problems with the assistance of interactive computer graphics (Reddy, 2006). It generally applies to all computer-related engineering applications. Some of its common applications are shown in Fig.1. Even computer-aided design (CAD) is considered as a subset only of CAE (Budynas et al., 2006).

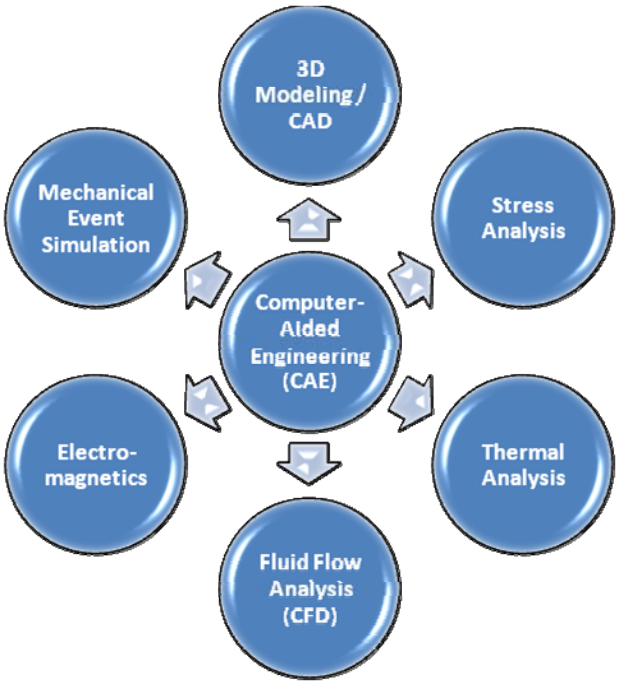


Fig1. CAE applications

3. Computer-Aided Engineering Procedures

The Finite-element method (FEM) or finite element analysis is normally used to solve problems such as stress or deformation analysis in CAE programs. With this method, a complex object is broken down into simpler elements. With these, a set of equations is formulated which, when solved, predicts the behavior of the object as modeled by the set of elements. The modeling of the object is known as finite-element pre-processing, and the validity of the solution is largely dependent on the skill of the modeling engineer. The solution of the equation is highly computer-intensive. The finite-element method is applicable for a wide variety of physical phenomena, including mechanical stress and strain, fluid flow, acoustics, heat transfer, and electrical fields (Reddy, 2006). Fig.2 illustrates the solution of a finite-element stress analysis problem on a cantilevered beam using SolidWorks.

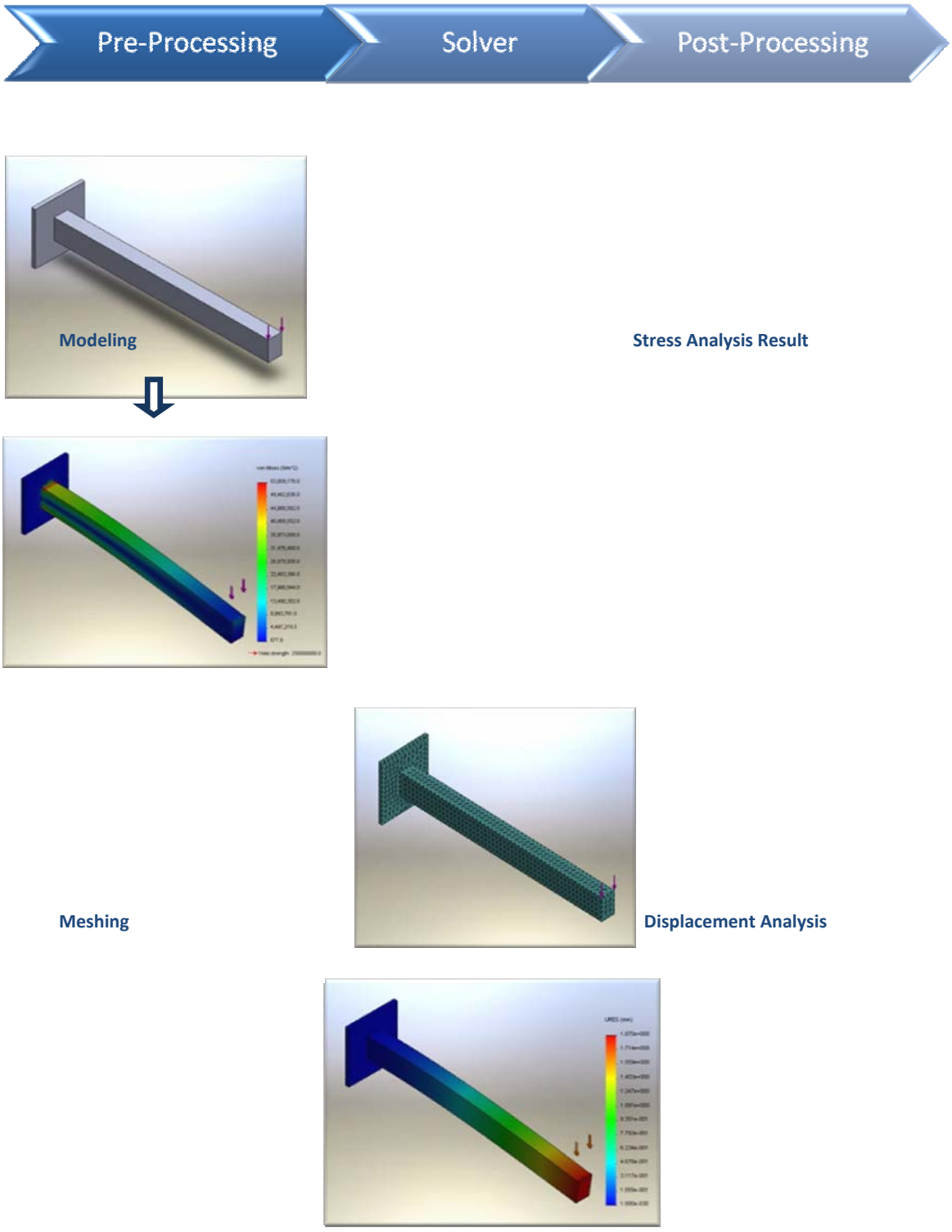


Fig 2. Finite-element stress analysis on a cantilevered beam

3.1 CAE Software

A typical CAE program is made up of a number of mathematical models encoded by algorithms written in a programming language. The natural phenomena being analyzed are

represented by an engineering model. The physical configuration is described by a geometric model. The results, together with the geometry, are made visible via a user interface on the display device and a rendering model (Reddy, 2006).

Depending on the software maker, the use of CAE to solve a single engineering problem might require the use of more than two softwares. Pre-processing, which includes the modeling, is done by one software. The use of another software is necessary for solving and post-processing of results. While some require sophisticated computer systems from workstations to mainframe computers, SolidWorks, in its stand-alone version, can perform the necessary tasks of simulation and analysis completely. This gives SolidWorks an advantage over other CAE softwares.

3.1.1 Solid Works® Overview

SolidWorks is a parasolid-based solid modeler and utilizes a parametric feature-based approach to create models and assemblies. Some of the distinguishing features of SolidWorks that can be used in the study of marine engineering are:

(1)3D Mechanical Design Applications

(2)Design Validation Tools

SolidWorks Simulation – a design validation tool that shows engineers how their designs will behave as physical objects.

(3)SolidWorks Motion – a virtual prototyping tool that provides motion simulation capabilities to ensure designs function properly.

(4)SolidWorks Flow Simulation – a tool that tests fluid-flow simulation and thermal analysis so designers can conduct tests on virtual prototypes.

(5)SolidWorks is an all-inclusive package; graphical user interface ties together problem set-up, pre-processing, solver and post-processor (http://en.wikipedia.org/wiki/SolidWorks).

3.1.2 System Requirements

The system requirements for SolidWorks depend partially upon which packages or modules are installed in each machine. An oversimplification would be to say that one should have a PC with an Intel Core2 Duo, 1.8 GHz, 2GB RAM, 20GB HD, Windows XP SP2 and Microsoft Internet Explorer 6 SP2. Supportive graphicS cards can be referenced on the vendor's website (http://en.wikipedia.org/wiki/SolidWorks).

4. Problem Selection

Among the various applications of CAE (Fig.1), stress analysis was specifically considered for investigation. Stress analysis is an engineering discipline that determines the

stress in materials and structures subjected to static or dynamic forces or loads. The aim of the analysis is usually to determine whether the element or collection of elements, usually referred to as a structure, can safely withstand the specified forces. (http://en.wikipedia.org/wiki/Stress_analysis). Stress is a fundamental topic which is covered both in Applied Mechanics and in Engineering Design of the marine engineering curriculum at Malaysian Maritime Academy (ALAM). The problem was taken from a reference book used by both lecturers and students.

A problem involving a flat steel bar consisting of two portions of different widths connected by fillets and subjected to a tensile force was considered (Fig.3). Maximum stress at fillet radius of (a) 10 mm; (b) 16 mm; and (c) 18 mm is required.

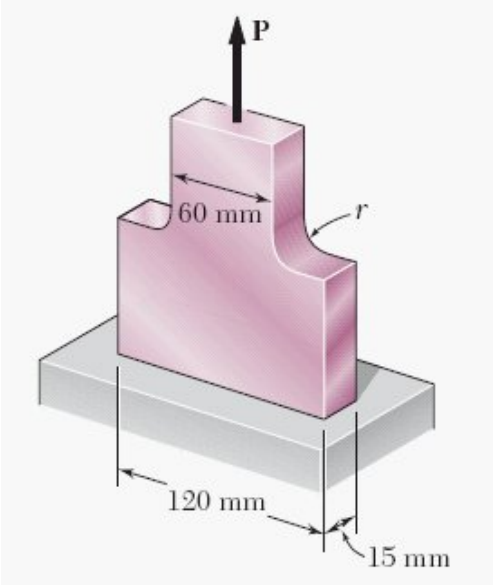


Fig 3. Problem sketch (Source: Mechanics of Materials 3rd Ed., Beer and Johnston)

4.1 Theoretical Solution

For a structural member with discontinuity caused by a change in cross section, high localized stress may occur near the discontinuity. To determine the maximum stress occurring near the discontinuity in this given structural member, it is necessary to compute the average stress σ_{ave} = P/A in the critical section and multiply the result obtained by the appropriate value of the stress-concentration factor K. In calculating the stress area, we consider the narrowest part of the connection, where, obviously, the highest stress occurs. Solving for the area, A:

$$A = (60)\ (15) = 900\ mm^2 = 900 \times 10^{-6}\ m^2$$

Stress concentration factor of the given discontinuity may be computed in terms of the ratios of the geometric parameters involved, such as r/d and D/d, as shown in Fig.4 .

$$\frac{D}{d} = \frac{120\ mm}{60\ mm} = 2.00$$

a) For fillet radius, r = 10 mm:

$$\frac{r}{d} = \frac{10\ mm}{60\ mm} = 0.1667$$

Using the curve in Fig.4 corresponding to D/d = 2.00, we find the value of the stress concentration factor corresponding to r/d = 0.1667 which is:

K = 2.06

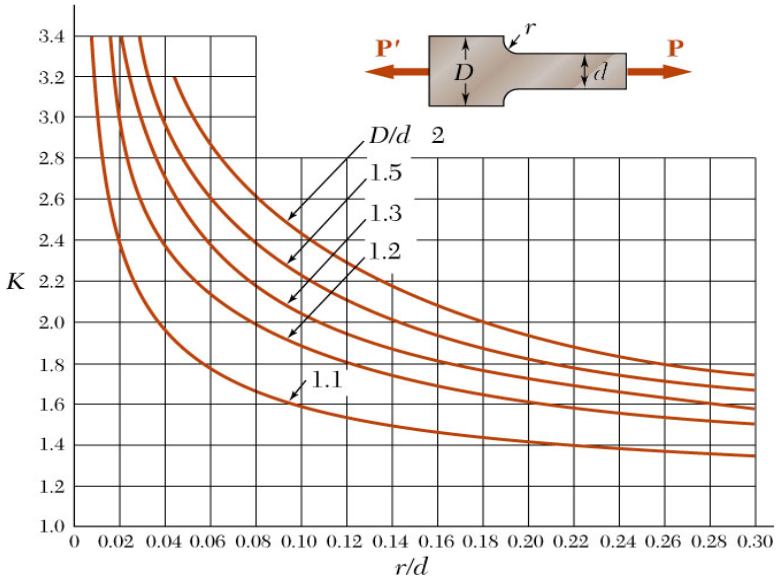


Fig.4. Stress concentration factors for flat bars under axial loading. (Source: Mechanics of Materials 3rd Ed., Beer and Johnston, Fig.2.64b)

Carrying this value and solving for the maximum stress, we have:

$$\sigma max = \frac{KP}{A}$$

$$\sigma max =$$

b) For fillet radius, r = 16 mm:

$$\frac{r}{d} = \frac{16\ mm}{60\ mm} = 0.2667$$

From Fig.4: K = 1.78 σmax = $\frac{KP}{A}$

σmax =

c) For fillet radius, r = 18 mm:

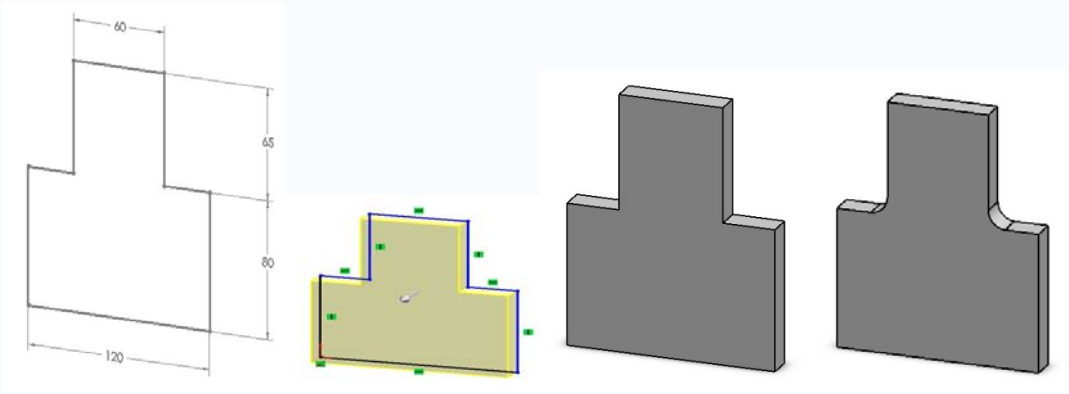
$$\frac{r}{d} = \frac{18\ mm}{60\ mm} = 0.30$$

From Fig.4: K = 1.75 σmax = $\frac{KP}{A}$

σmax =

4.2 Virtual Fabrication/3D Modeling

In using CAE to do analysis, the first step is to build, or virtually fabricate, the model. SolidWorks is a parasolid-based solid modeler and utilizes a parametric feature-based approach to create models and assemblies. It usually starts with a 2D sketch consisting of geometry such as points, lines, arcs, conics (except the hyperbola) and splines. Dimensions are added to the sketch to define the size and location of the geometry (Fig.4a). To convert it into 3D, any of the feature commands can be used; in this case, the "Extrude" feature to generate the 3D model (Fig.4b). The "Fillet" feature is then used to create the fillets with desired radius. In this command, the edges, where the fillet is to be applied, are first selected; then the specific radius is entered in the software. The finished 3D model with a 10 mm fillet radius is shown in Fig.4d.



(a) (b)

(c) (d)

Fig 4. Steps in virtual fabrication

It is necessary to assign the type of material if analysis is to be done in CAE. This is contrary to the theoretical solution shown above, where maximum stress can be calculated without even knowing the type of material the structure is made of. For this problem, alloy steel was the material selected. Alloy steel is a typical material in the manufacture of steel structures and machine parts. The software provides a selection of various materials, metal and non-metal, which could be used for several specific applications. Upon assigning the type of material, use of the "Rendering" function gives it a realistic look as seen in Fig.5.

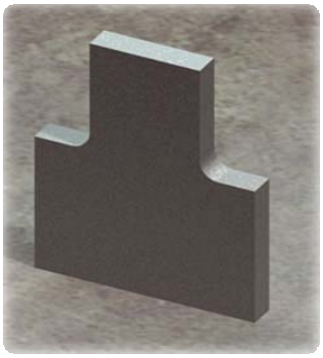


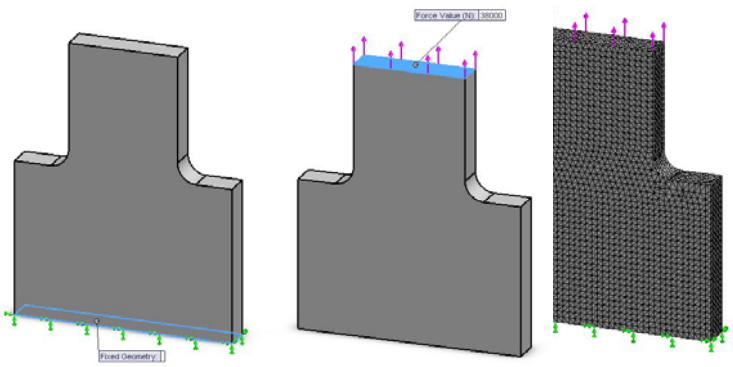
Fig 5. Model after assignment of material and rendering

5. Virtual Testing

Upon virtual fabrication of the structural model and specification of the type of material, virtual testing can now be done. Most CAE softwares are capable to analyze combined loads in static and dynamic conditions. In this study, a static problem is involved with a tensile force of 38,000 N acting on the top of the structure. One of the requirements before the

software can "solve" the problem is the assignment of the fixed part which will keep the model in static condition; in this case, the bottom part as shown in Fig 6a. The simulated tensile force acting on one phase of the virtual model is shown in Fig 6b.

After the simulated load and fixture have been assigned, it is then necessary to "mesh" the model. In this process, the model is broken down into simpler elements for analysis (Fig.7). Once "meshing" has been done, the "Run" function will start the solver for the active study and will automatically generate the desired result by means of a color chart. Maximum and minimum stress values and their locations can easily be identified by referring to the color chart (Fig.8).



(a) (b)

Fig.6. Virtual model after assignment of fixture and load

Fig 7. Meshed model

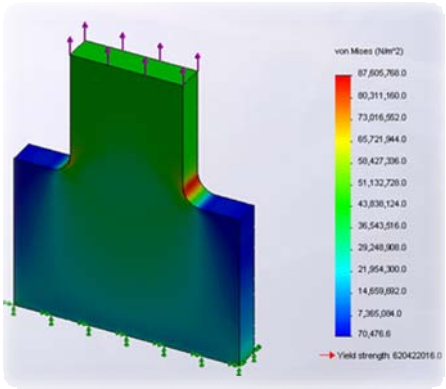


Fig.8. Generated result showing maximum and minimum stress by means of color chart

Apart from the color chart, a HTML report for the current analysis study can be generated, showing all the necessary information. Maximum and minimum values of stress, strain and displacement can be found in the report with exact locations in xyz coordinates (Table 1).

Table 1. Table from the HTML report generated by the software

Name	Type	Min	Location	Max	Location
Stress1	VON: von Mises Stress	70476.6 N/m^2 Node: 453	(120 mm, 80.0034 mm, 15 mm)	8.76058e+007 N/m^2 Node: 4024	(29.511 mm, 86.9202 mm, 9.99977 mm)
Displacement1	URES: Resultant Displacement	0 mm Node: 29	(0 mm, 0 mm, 0 mm)	0.023222 mm Node: 628	(89.9983 mm, 145.023 mm, 14.9996 mm)
Strain1	ESTRN: Equivalent Strain	4.82307e-007 Element: 9025	(119.285 mm, 79.2892 mm, 0.624992 mm)	0.000312447 Element: 6411	(30.2225 mm, 87.9228 mm, 10.686 mm)

6. Comparison of Results

Table 2. Comparison of results from theory with results from CAE software

Test	Theory	CAE Analysis	Variance
Maximum Stress			
10 mm fillet	87.0 MPa	87.6 MPa	0.69 %
16 mm fillet	75.2 MPa	75.6 MPa	0.53 %
18 mm fillet	73.9 MPa	72.8 MPa	1.49 %

7. Summary and Conclusions

It was proven in this study that a CAE software is capable to solve and analyze engineering problems with minimum acceptable variance when compared with theoretical results. With the user's sufficient knowledge on the use of the software, fabrication or generation of almost any virtual structure is possible, with excellent graphics display. Although the testing conducted for this study was a simple tensile test, the software had in store various validation tools capable of performing various types of engineering tests. Other tools available included heat transfer analysis, computational fluid dynamics (CFD) and mechanical event simulation.

For an engineer who wishes to design and analyze a given structural member but cannot carry out such analysis due to unavailability of testing equipment, a CAE software can be considered as an efficient alternative solution.

For an educator who seeks the enhancement of the learning effectiveness of traditional classroom instruction, the use of a CAE software can be considered as a teaching tool. Its excellent graphics display, animation and multiple functionalities give it a cutting-edge advantage. It can also be used to reinforce theoretical learning with practical application by means of virtual testing and experiment. In the field of marine engineering, a list of suggested subjects and topics which can use CAE is found in Table 3. However, to maximize the benefits from the use of the CAE software, knowledge of and proficiency in running the software is a basic requirement. It is the educator's creativeness and the proper selection of subjects and topics that will determine its effectiveness. Online tutorials on the use of the software which shows the "tricks and techniques" are available at the net. These may be very useful for users who have not undergone formal training.

The use of the CAE software poses the challenge to learn independently and think critically. It makes 3D modeling and analysis of engineering problems more interesting even while yet exploring other functions and tools available in the software.

Nevertheless, it has to be remembered that the CAE software is no substitute for the human thought process. It is only a tool. Results generated can be far from the truth if the input data are incorrect and the process used to analyze is inappropriate. It is the user's responsibility to assure the validity and accuracy of the results. Comparison should always be done between the results obtained with theoretical results.

8. Acknowledgement

The authors wish to thank the following for their invaluable support and contributions: Engr. Rajoo Balaji and Engr. Chia Kim Wah, Senior Lecturers of Malaysian Maritime Academy (ALAM), Dr. Alberto J. Trinidad, Dean of John B. Lacson Foundation Maritime University (JBLFMU) Graduate School; and last but not the least, the management of Malaysian Maritime Academy (ALAM).

Table 3. List of Marine Engineering subjects where CAE software can be used

Subject	Topic	CAE Application
Applied Mechanics	Stress & Strain	Stress Analysis
	Thin Shell	Stress Analysis
	Torsion	Stress Analysis
	Bending & Stress in Beam	Stress Analysis
	Hydraulics	Computational Fluid Dynamics (CFD)
Engineering Materials	Materials Testing - Destructive	Stress Analysis
Thermodynamics	Heat Transfer	Heat Transfer Analysis
	Nozzles	Computational Fluid Dynamics (CFD)
Engineering Design	Screw Threads & Fasteners	Stress Analysis
	Cams	Stress Analysis
	Bearings	Stress Analysis
	Gears	Stress Analysis
	Keys & Keyways	Stress Analysis
	Shafts	Stress Analysis
	Springs	Stress Analysis
Engineering Drawing	Pictorial Projection	3D Modeling / Computer-Aided Design (CAD)
	Cross-Sections	3D Modeling / Computer-Aided Design (CAD)
	Assembly	3D Modeling / Computer-Aided Design (CAD)
Naval Architecture & Ship Construction	Structural Strength	Stress Analysis
	Ship Resistance	Computational Fluid Dynamics (CFD)
	Rudder Theory & Calculation	Computational Fluid Dynamics (CFD)

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Utilization of Web-based Course Management System for M. E. T: A Theory-based Approach to Development of Criteria for Selection

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Abstract

The revised STCW Convention provides for the use of distance learning and e-learning in Maritime Education and Training (MET). The revised Section B-1/6 contains guidelines for training by distance learning and e-learning, including the use of learning management systems such as Web-based course management systems. Although being currently a very widely applied technology in instruction, especially for learners with limited access to traditional classroom instruction, no definite models for Web-based instruction have yet emerged. This paper discusses the effective utilisation of Web-based course management systems for maritime instruction within the framework of strategies supported by learning theories for Web-based course design. These strategies are combined with relevant STCW provisions to develop comprehensive criteria for the selection of a Web-based learning management system for M.E.T.

1. Introduction

The emphasis that the maritime industry places on adequate training of seafarers as a vehicle for the achievement of its objectives cannot be over-emphasized. However, the nature of employment of the seafarers demands long separation from shore-based training facilities. This situation presents a major challenge of limiting the access needed by shipboard personnel to quality education and training for updating their competencies for the performance of their duties. Effective use of technology is a key means of addressing this challenge within the framework of acceptable standards.

It is therefore a welcome development that the recently concluded amendments to the International Convention on Standards of Training, Certification and Watchkeeping for Seaferers, 1978 as amended (STCW Convention) has introduced guidelines for the use of

distance learning and e-learning for the training of seafarers . Section B-I/6 provides that "parties may allow the training of seafarers by distance learning and e-learning in accordance with the standards of training and assessment set forth in Section A-I/6 …" (IMO 2010). This paper focuses on the effective utilisation of a system of e-learning, the Web-based course management system, for maritime instruction. The paper discusses Web-based Instruction and access to M.E.T, learning theories and design of Web-based instruction, before recommending the criteria for selecting a Web-based learning management system for maritime instruction.

2. Web-based Instruction and Access to MET

The goal of forward-thinking educational systems involves the continual exploring of adaptation of technology to provide global access to quality education. Thus in the past maritime education and training institutions have explored and provided the required training through school house courses, distance learning via paper courseware, and computer based training via CD. The drive today is to utilise the Internet and the World Wide Web to provide a networked learning environment in which any student or teacher can view instructional content, collaborate with educators, evaluate academic performance and access any learning resources at any time and any where in order to achieve their educational objectives. Blackboard (2008) posited that such an environment affords institutions important benefits such as student-centred learning, greater instructor efficiency, anytime and anywhere access, improved evaluation and outcomes management and access to high quality content.

Davidson & Bruce (2003) also noted that by taking advantage of dynamic content combined with Web-based, open-imaged platforms, ship operators are able to improve onboard tasks and speed the understanding of system operations. Videotel (2010) have asserted that it is now possible to study maritime training courses online, meaning companies and individuals interested in developing skills and careers can train anywhere they have access to the Internet. The system may combine video, graphic sequences, full audio narration, interactive tests and exercises plus online access. Web-based instruction may be defined as a student-centred instruction delivered on the World Wide Web and utilising the hyperlinked Web-based resources for learning.

2.1 Learning Theories And Design of Web-based Instruction

A popular research design in instructional technology today is to compare academic performance of students in Web-based instruction and traditional classroom instruction. Herrington, Oliver, Herrington & Sparrow (2000) and The Cognition and the Technology Group at Vanderbilt (1993) however cautioned about the defects of this design because of the difficulty of determining the traditional approach. The authors argue that many of the course

units offered online are "re-incarnations" of traditional instruction, therefore depriving Web-based instruction of the affordances and opportunities offered by the Internet and the Web for education.

The reason for the above inadequacies seems to stem from the fact there are yet no definite models for the design of Web-based instruction although much research is devoted to the subject. Many Web-based course designs are still based on the traditional approaches such as the Dick & Carey Models, 1990 and 1996, cognitive flexibility theory, and constructivist learning environment (Herrington et al 2001; Nam & Smith-Jackson 2008) This paper recognises that there are several Web-based course design strategies supported by different learning theories which can be incorporated into the design of Web-based instruction. Some of these theories and their Web-based course design strategies are presented below.

i) Constructivist Theories

The constructivist learning theories consider learning to be determined by the complex interplay among student's existing knowledge, the social context, and the problem to be solved. Instruction is therefore important in providing students with a collaborative situation in which they have both means and the opportunity to construct new and situationally-specific understandings by assembling prior knowledge from diverse sources (Ernest & Newby, 1993 as cited in Newby, T. J, Stepich, D. A., Lehman, J. D. & Russel, J. D., 2006). According to the constructivist perspective, the primary responsibility of the instructional expert is to create and maintain a learning environment that has two essential characteristics: learning in context and collaboration.

Bruner's constructivist theory, for example, is based upon the study of cognition. A major theme in this theory is that learning is an active process in which learners construct new ideas or concepts based upon their current and past knowledge. Cognitive structures are used to provide meaning and organization to experiences and allow the individual to go beyond the information given. Brunner's constructivist theory therefore supports Web-based instruction to be;

- concerned with the experiences and contexts that make the student willing and able to learn (readiness)
- be structured so that it can be easily grasped by the student (spiral organization)
- designed to facilitate extrapolation and or fill in the gaps (going beyond the information given).

ii) Vygotsky's Theory of Social Cognitive Development

According to Patsula (1999), a notable aspect of Vygotsky's theory is the claim that instruction is most efficient when students engage in activities within a supportive learning environment and when they receive appropriate guidance that is mediated by tools (Vygotsky 1978, as cited in Gillani & Relan 1997, p. 231). These instructional tools can be defined as cognitive strategies, a mentor, peers, computers, printed materials, or any instrument that

organizes and provides information for the learner. The Vygotsky's theory of social cognitive development supports the following Web-based course design strategies.

- Simplify navigation.
- Create effective menus. Well-designed menus help learners develop an accurate mental model of the structure being searched.
- Include indexes, table of contents, and search capabilities.
- Clearly identify content with appropriate headings and titles. The title of the site should reflect its purpose and audience.
- Place most important information on the top-left. Important information should go to the top-left. The lower-left is the least noticed area of the page/screen.

iii) Situated Learning Theory

At its simplest, situated learning is learning that takes place in the same context in which it is applied. Situated learning was first proposed by Jean Lave and Etienne Wenger as a model of learning in a community of practice. Lave and Wenger (1991) as cited in Wikipedia (2010) argue that learning should not be viewed as simply the transmission of abstract and decontextualised knowledge from one individual to another, but a social process whereby knowledge is co-constructed; they suggest that such learning is situated in a specific context and embedded within a particular social and physical environment. A learning environment is considered authentic if the tasks parallel real world situations. Situated learning theory emphasizes social interactions and authentic learning. Students who work on an authentic learning task learn associated facts and skills because they need to know these things to accomplish the task.

Herrington, Oliver, Herrington & Sparrow (2000) reported that the model used at Edith Cowan University, Australia to guide the development of new online course units was based largely on the theory of situated learning and upon the philosophy of constructivism. Herrington & Oliver (2000) as cited in Herrington et al (2000) stated that the model has been used extensively for the design of multimedia, but it is appropriate to other learning modes, in particular online learning environments. The model comprises nine characteristics that can be used to guide the development of Web-based course units. These characteristics include:

- Authentic context that reflects the way the knowledge will be used
- Authentic activities
- Access to expert performances and the modelling of processes
- Multiple roles and perspectives
- Collaborative construction of knowledge
- Reflection
- Articulation
- Coaching and scaffolding

- Authentic assessment

3. Web-based Course Management Systems (WBCMS)

The uses of the Web as part of the Internet, may be classified into information, communication and data transfer services (Wikipedia 2010). Newby et al (2006) however asserted that the three most common educational functions of telecommunication tools, like the Internet and the Web today, are communication, information retrieval, and information publishing. The authors further noted that the Internet and the Web provide teachers and students with unprecedented access to up-to-date information and resources, and it supports new forms of communication, such as electronic mail, instant messaging, internet-based telephony, and video conferencing.

A Web-based course management system is an Internet application software which have been developed to integrate and utilise the resources of the Internet and the Web for online course delivery and management (McKimm, Jollie & Cantillon 2003; Siekmann 2000). Locatis (2001) recognized Learning Management Systems or Web-based course management systems as Website management/publishing tools which have developed as an authoring approach. He noted that they provide templates for creating courses for delivery via the Internet. This system of integrated Web-based resources offers appropriate security for the instructional materials and activities to be undertaken on the environment; suitable database management system; compatibility between participants' systems; and exact capabilities with respect to communications, formats for course content organization, files management, exercise and assessments methods, and course and student management (Siekmann 2000).

These systems of Web-based resources are used by institutions and individuals to offer either entirely Web-based course or Web-based component of a traditional institution's course. Users of commercial Web-based course management systems require a license at specified costs usually related to the number of students or fixed rate for unlimited number of students. The right Internet browser and compatibility between system and user's hardware and software equipments are also required (Elearnity 2005; Edutools 2010; Blackboard 2010; WebStudy 2010; Atutor 2010; Angell 2010). The following course delivery and management resources/facilities are usually available on Web-based course management systems

i) Communication tools
ii) Content development tools
iii) Course delivery tools
iv) Productivity tools
v) Student involvement tools
vi) Administrative tools
vii) Specification of hardware/software requirements

Wijekumar (2005) has, however, cautioned that Web-based learning environments are a great asset only if they are designed well and used as intended. The urgency to create courses in response to the growing demand for online learning, he noted, has resulted in a hurried push to drop PowerPoint notes into Web-based course management systems (WBCMSs), devise an electronic quiz, put together a few discussion questions, and call it a course. He stressed the need to also utilise the motivational, instructional, modeling, feedback, and assessment tools of Web-based learning environments.

The control panel of a typical example of a Web-based course management system, Blackboard Academic Suite 8.0, showing the group of features on the system is shown in Figure 1.

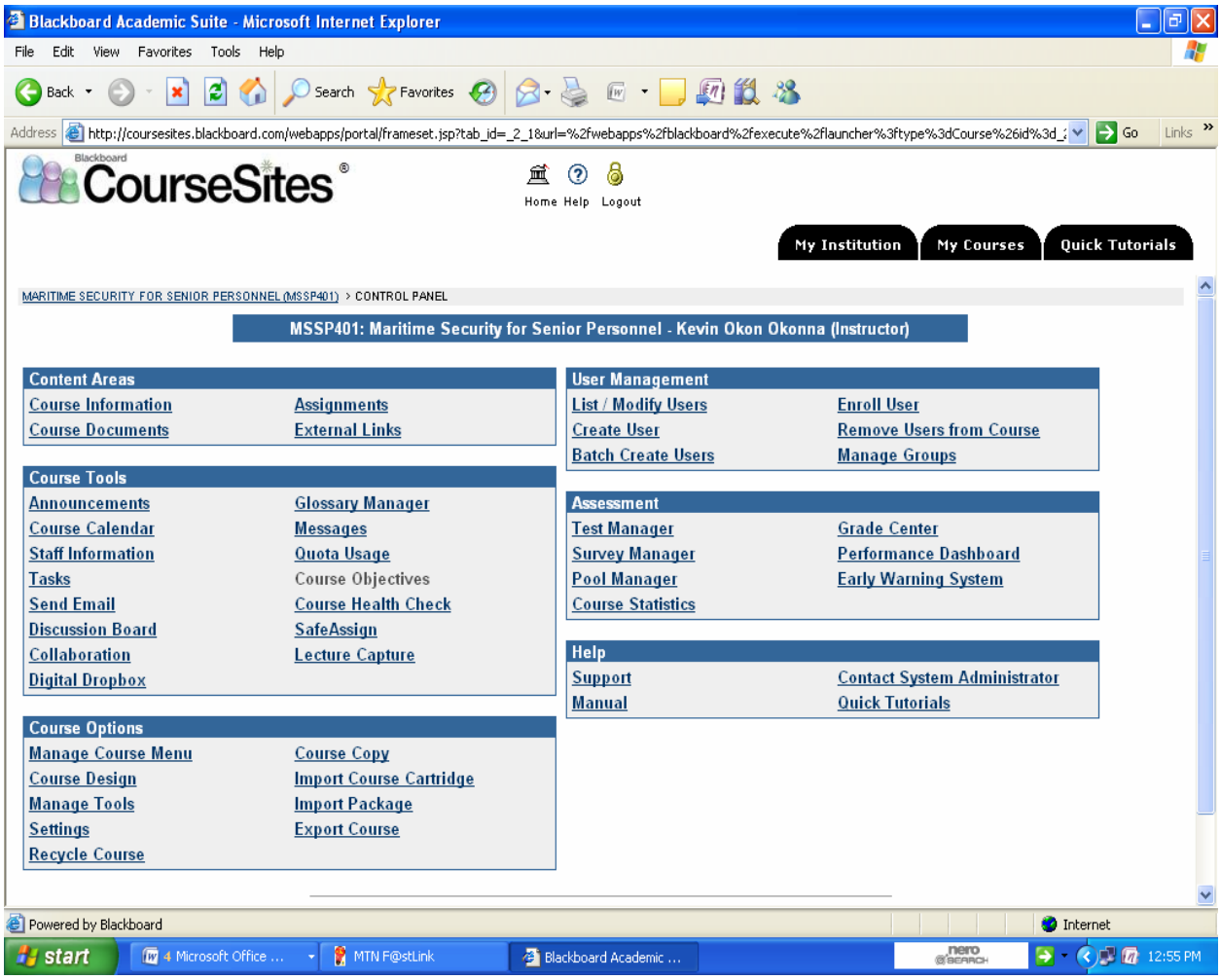

Figure 1. Control panel of Blackboard Academic Suite 8.0 showing available tools

4. The Criteria for Selection of Web-based Course Management System

Several criteria for comparison of Web-based course management systems have been utilised by Hall (1999), Okonna (2001) and Edutools (2010) presents a range of features

necessary to consider. Information on the individual items of facilities and tools available on particular Web-based course management systems can be obtained from the Websites of the applications themselves. However, Edutools at http://www.edutools.info/item_list.jsp?pj=4 presents the information on several of those Web-based course management systems with international repute as well as tools for comparing the resources on different systems. The individual items of facilities and tools available on a particular Web-based course management system are in upwards of one hundred and the space available for this paper is insufficient for presentation.

The criteria for selection of a suitable Web-based course management system for maritime instruction need to combine the resources necessary to create and maintain a learning environment that allows learning in context and collaboration and also meet the guidelines provided under the STCW Convention. The convention requires that any e-learning programme must:

- have clear and unambiguous instructions for the trainees to understand how the programme operates;
- is structured in a way that enables the trainee to systematically reflect on what has been learnt through both self assessment and tutor-marked assignments; and
- provides professional tutorial support through telephone, facsimile or e-mail communications

The convention also states that each Party should ensure that approved assessment procedures are provided for any distance learning and e-learning programme, including:

- clear information to the students on the way that tests and examinations are conducted and how the results are communicated;
- have test questions that are comprehensive and will adequately assess a trainee's competence and are appropriate to the level being examined;
- procedures in place to ensure questions are kept up to date and;
- the conditions where the examinations can take place and the procedures for invigilation to be conducted;
- secure procedures for the examination system so that it will prevent cheating;
- secure validation procedures to record results for the benefit of the Party.

Considering the above guidelines, a WBCMS for maritime instruction should have the following tools amongst others:

- Communication tools like e-mail, real-time chat and digital drop-box
- Discussion management tools
- Facilities for instructors to view statistical summaries of discussions displaying participation which can be used to generate grades.
- File exchange facilities

- Calendar/student progress review
- Facilities for students to view their grades on completed assignments, total points possible, course grade, and compare their grades against the class performance
- Course content search tool
- Tool for working offline/synchronize
- Tool for working offline/synchronize
- Student orientation/help tools
- Online tutorials for students that help students learn how to use the system.
- Facilities for group work
- Facilities for instructors can assign students to groups
- The system can randomly create groups of a certain size or a set number of groups
- Each group can have its own discussion forum.
- Each group can be given group-specific assignments or activities
- Students can create online clubs, interest, and study groups at the system level
- Authentication tools
- System administrators can allow guest access to all courses.
- Course authorization
- Tool for restricting access based on roles and roles can also be customized by the service provider
- Facilities for registration integration
- Hosted solution
- Course management tools
- Facilities for instructors can selectively release assignments, assessments, and announcements based on specific start and stop dates
- Facilities for instructors can personalize access to specific course materials based on group membership
- Facilities for instructors to get reports showing the time and date and frequency students as an aggregated group accessed course content
- Different types of test questions
- Automated testing management
- Facilities for instructors to create self-assessments
- Facilities for instructors to set a time limit on a test
- Facilities for instructors to permit multiple attempts
- Facilities for instructors to specify whether correct results are shown as feedback
- Online gradebook
- Accessibility compliance certification
- Customization of look and feel
- Facilities for institutions to create their own look and feel templates across the entire system, including their own institutional logos, headers, and footers

- Instructional design tools
- Facilities for instructors to organize learning objects, course tools, and content into learning sequences that are reusable
- Specified client browser requirements
- License cost format for WBCMS is reasonable and simple

The above list of WBCMS resources, facilities and tools are not exhaustive on the individual opportunities and affordances of these systems for e-learning. However, they are considered to present the minimum to allow the satisfaction of the provisions of the STCW Convention and also allow the creation and maintenance of a learning environment that allows learning in context and collaboration, which is supported by the constructivist and situated learning theories forming the framework for this paper.

5. Conclusion

This paper has noted the significance of the inclusion of the guidelines for use of distance learning and e-learning in the training of seafarers in the recently concluded amendments to the STCW Convention. This development is recognised as an important step in overcoming a major barrier to use of technology in providing access to M.E.T. The paper also identified the need to use e-learning environments which allow learning in context and collaboration as supported by the constructivist and situated learning theories. It was also noted that in order for the great assets of Web-based learning environments to be realized they have to be designed well and used as intended. The requirements for Web-based course management systems (WBCMSs) to utilise the motivational, instructional, modeling, feedback, and assessment tools afforded by Web-based learning environments was therefore stressed. The paper also recommended some key criteria relevant for the selection of a Web-based course management system for maritime instruction, giving consideration to the guidelines stated in Section B-I/6 of the STCW Convention.

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The Distance Education for Seafarers Project: Collaboration, Challenges and Benefits

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Abstract

The shipping industry is reliant on the Philippines to provide a large and disproportionate number of seafarers for its global fleets. Despite the fact that the greatest demand is for those with officer level training, approximately 85% of seafaring Filipinos work as the lower paid ship's rating rather than as a ship's officer. Although the Philippines has in excess of one hundred maritime schools there are barriers that impede many ratings from obtaining adequate and necessary education and the training that is required in order to fill these more senior positions. The Distance Education for Seafarers Project, developed jointly by Canadian and Philippine maritime universities and government oversight agencies, aims to improve institutional capacity while working with the appropriate government departments to ensure compliance with international standards. The Commission on Higher Education of the Philippines, and John B. Lacson Foundation Maritime University, working with the Canadian partner institution identified the appropriate distance education platform and the necessary institutional supports for successful online programming. Training sessions were conducted that enabled participants to modify classroom material for distance education. Web-based technologies were employed to offer training courses in design and delivery. Train-the-trainer workshops, used to involve other Higher Education Institutions in this distance education process, were to be facilitated. Ultimately the project will improve access to upgrading and training for unemployed and underemployed Filipinos through the development of distance education policy and programming. Numerous benefits were derived through the project but there were also challenges involved in this collaborative activity.

Keywords: Distance education, MET, technology, train-the-trainer, web-based training.

1. Introduction

The archipelagic formation of the Philippines contains in excess of 7000 islands and has a population of over ninety million, with virtually all Filipinos having some linkage to the ocean. Due to the innate affinity for the sea, seafaring is a popular career choice for many Filipinos and consequently the Philippines claims approximately 25% of the world's seafarers (Virtudazo 2010). The country is considered by many as the world capital for maritime manpower. The growing demand for skilled and globally competent seafarers requires a sustained and consistent delivery of quality training and education among maritime training institutions, and the Philippines will need to keep pace if it wishes to remain competitive, particularly as the successful employment of Filipino seafarers is dependent on their level of education and seafaring capabilities.

Data on student enrolment in maritime schools in the Philippines discloses that of the 60,000 new students each year 25,000 complete the three-year maritime course and about 5,000 return to their schools to earn their bachelor's degree after cadetship or on-the-job training. A minimal number pursue the path towards becoming management level or operational level officers while the rest remain as ordinary seafarers (Global Institute of Logistics 2009). The Distance Education for Seafarers (DES) Project was designed to enable the ordinary seafarer an additional opportunity to progress to officer status and achieve the benefits associated with that career path.

2. Project Partners

The DES Project was proposed, awarded, and partially funded through the Canadian International Development Agency (CIDA). The project required a Canadian and an in-country educational partner, and because the project related to government over-sight the government department in charge of maritime education was also to be involved. The three primary players were selected based on previously activities and through established synergies.

John B. Lacson Foundation Maritime University (JBLFMU) is a leading MET provider in the Philippines, the only maritime university in the country, and is committed to the development of a culture of excellence in maritime education. This university had been looking to bridge the training gap required for the upgrading of ratings and to help them progress to officer status. It recognized the benefits of distance education subsequent to the Philippine's Government approval of this mode of instructional delivery in 2000, and has instituted its own policy and procedures manual for distance education (JBLFMU 2009). The university had already intended to use online delivery in the global delivery of education to a wide range of students in order to enhance their competencies; to better prepare them for a career in maritime institutions and industries; to produce globally competitive seafarers,

managers and leaders in maritime institutions; and to answer the needs of an ever-dynamic maritime environment.

The Fisheries and Marine Institute of Memorial University (MI), located in Newfoundland Canada has wide-ranging expertise in most facets of marine education and training and additionally has been involved in numerous and diverse international educational projects for many years. It has developed and offered distance education courses within the institute and for delivery on a global basis and has faculty that are experienced in curriculum development; curriculum design; prior learning assessment; train-the-trainer and that have many other attributes suitable for this partnership.

The Commission on Higher Education (CHED) is the governing body for post-secondary education in the Philippines with a mandate to promote quality and accessible education within that country. CHED (2010) is responsible for formulating plans, policies and strategies in regards to higher education and thus it was imperative that this agency be involved in this project due to far reaching implications for the marine training and education sector.

3. The Distance Education for Seafarers (DES) Project

The Distance Education for Seafarers Project piggy-backed on a previous project entitled the Maritime Training Compliance Project which was undertaken in the Philippines by the primary partners - CHED and MI. That project was designed to improve government and institutional capacity in order to comply with international standards, most notably the STCW 95. While many institutions are willing to work together, lack of funding is often one barrier to project development. The first project – funded by the Canadian International Development Agency (CIDA) – served as a stepping stone and a prerequisite for funding for the DES Project.

The DES Project had the lofty goal of improving access to training particularly as it applied to upgrading to officer status for unemployed and under employed Filipino seafarers through the development of distance education policy and programming. The project was to provide requisite instructor training through a progressive series of workshops designed to build on the skills gained in each of the previous ones.

During the initial project visit to JBLFMU in January 2009 discussions with faculty and staff had established that none of the potential participants for the initial workshop had ever facilitated an online course nor had they taken an online course as a student. Further discussion revealed that much of the existing course content was not available in electronic format. In addition, content that was available in electronic format required some revision in order to make it more suited to online delivery. The initial proposal had provisions for a non-specific online component and this provided an ideal opportunity to address all three of these noted issues at the same time. JBLFMU however had started down the road of distance education and did have support mechanisms in place to enhance the distance education

process. Furthermore they had dedicated personnel that were keen to learn and to hone distance education skills.

An online course entitled Course Development for Online Delivery was developed by Marine Institute faculty who had backgrounds in curriculum and instructional development, educational media development and project management. These persons, having considerable experience with online course facilitation, delivered this course to participants at JBLFMU and CHED during May and June of 2009. The course was delivered with the co-operation of Distance Education and Learning Technologies (DELT) at Memorial University using their Desire 2 Learn (D2L) learning management system. A total of 43 participants (37 JBLFMU and 6 CHED), including management, faculty and staff, were registered for the course.

The design and delivery of the online course was used to address three primary objectives. The first was to emphasize course development for the online environment. It was felt that JBLFMU instructors needed to review and possibly update their existing classroom materials prior to using them for online delivery. The course also provided participants with suggestions and ideas on how to best structure their course content, and presentation and evaluation methods.

The second course objective was to provide participants with the experience of participating in an online course as students. This gave them the opportunity to be exposed to some of the issues that their own students would experience with online courses. This exposure would be beneficial to the participants as they made the transition from classroom teaching to teaching in an online environment.

The third objective was to provide participants with examples of online delivery and facilitation methodologies that they could adapt for their own online facilitation.The facilitators for this course made every effort to acquaint the participants with best online practices in order to provide a model for discussion during subsequent face-to-face workshops.

While there were some initial issues with registration and log-on for the course, it ran without any major problems. The 11.5 hour time difference did not impact the course delivery as there were no synchronous activities included. An additional benefit of the course was the exposure to the D2L learning management system. Since JBLFMU had yet to identify the system that they would eventually use, this was an opportunity to identify features that they would want included in their system.

As a follow-up to the online course, a number of face-to-face workshops and one-on-one meetings were conducted with JBLFMU and CHED participants in September, 2009. The intent of these workshops and meetings was to provide participants with training related to the development and delivery of online courses and to strengthen their online facilitation skills.

The content and layout of the online course was reviewed with the intent of identifying specific issues that participants were experiencing with their online course development.

Identified issues were tagged for later discussion in the one-on-one sessions. A number of the techniques used by the online course facilitators were also discussed during this workshop. Identification of these techniques served to introduce the participants to some of the differences between classroom and online course delivery modes. In general, the participants felt that the online course had achieved the stated objectives and the majority of the instructors, who were actively preparing their courses for the change to online delivery, stated that the content had been beneficial to them.

For the purposes of this project, a working knowledge of project management processes and techniques was identified as a desirable outcome.One of the workshops focused on providing an introduction to project management at a general level.Once this foundation was set, course development was then examined as a project that could benefit from the application of these techniques. The remainder of the workshop focused on processes and tasks associated with instructional development preparation, planning,and support specifically associated with online course and program development and delivery. A course development model and framework was proposed using a teamwork approach.

A subsequent workshop looked at project management in the broader context of developing or revising a complete program, and preparing for an increase in activity in terms of online delivery for programs, and courses. Emphasis was placed on infrastructure and policy/procedural planning. The topics included a review of project management terms and techniques; big picture preparation and planning; technological needs analysis; and delivery, support and administrative process planning.

A key aspect identified during this workshop was the potential for blended or hybrid learning and how such an approach may best lend itself to effective delivery of the significant practical and hands-on components associated with maritime education. It was identified that the blended learning approach would need additional planning due to the potential impacts on curriculum scheduling.

The participants were given several months to sharpen and practice these skills before the next phase of the project. In February 2010 a three-day workshop was conducted that was designed as a train-the-trainer event to prepare participants to host their own workshop for Higher Educational Institution (HEIs) participants later in the project. It involved MI faculty and fifteen JBLFMU faculty and staff, and two CHED officials. Distance education material that had been prepared by JBLFMU in the interim was reviewed and the talent, interest and progress of the participants were evident in the materials that had been prepared. Further topics were covered during this seminar and activities organized to help attendees feel more comfortable when designing and running their own workshop.

The HEI workshop is scheduled for October 2010 with JBLFMU faculty facilitating and with faculty members from the other educational institutes of the Philippines - as selected by CHED – as participants. The intent of that three day activity is to facilitate instruction of on line learning for HEI faculty who may have varying backgrounds and levels of DE expertise.

It is hoped that all participants will then continue with development and delivery of distance courses within their own institutions.

The end result of the DES Project is that faculty from a wide range of HEIs will then be able to take the common CHED curriculum and modules and convert them to a distance education delivery format that will be made available to a global audience of Filipino seafarers.

4. Collaboration

With the advances in modern communications geographic proximity is no longer a prerequisite for collaboration between MET institutions. This project gives evidence to this statement as the primary partners are located almost half the world away from each other but able to successfully collaborate on this project.

While proper planning is instrumental in international project work, luck will sometimes play a role. Some may deride international academic conferences but this project demonstrates in part one of the numerous benefits of such collegial gatherings. A meeting of MI and JBLFMU personnel at an international conference in 2005 proved fortuitous when the call for projects was initiated by CIDA. The JBLFMU had already commenced work in the area of distance education and it was their distance education coordinator that was at that conference along with a number of MI personnel.

MET organizations are frequently open to collaboration however the required funding necessary to incubate this process is not always available. In this case funding from CIDA precipitated the process. Funding has also allowed JBLFMU and CHED to send representatives to MI on two occasions to meet with key Canadian government and educational players. The first visit early in the project helped streamline the nature of the project. MI distant delivery and support mechanisms were analyzed, reviewed and discussed and lessons learned by MI in the development of their distance education program were shared. The second visit in the last quarter of the project enabled CHED and JBLFMU to evaluate progress and to pose additional questions necessary to ensure the goals of the project were met. This positive collaboration has resulted in willingness by all parties to share and for each to learn from the others.

A closer working relationship between CHED and JBLFMU and indeed the other HEIs is anticipated. As iterated CHED is the government agency responsible for education and training in the Philippines. Having CHED representatives as active participants in the project, including help with the design of the project; travel to MI with JBLFMU staff; participation in the various workshops; and their general interaction with all project participants has allowed each participants to see the benefits and challenges through the 'lens' of each other's organization. Additionally it is hoped that this collaboration will lead to other projects.

It is anticipated that the project will also see enhanced cooperation among the HEIs. Educational institutions will often operate autonomously. The HEI workshops and continued interaction and networking by faculty will no doubt have a positive influence not only with regards to this project but that will spill over into other areas of mutual interest including education and training, research and institutional management.

5. Challenges

With all projects there are challenges, and although the benefits far exceed the disadvantages this one has been no different. One of the primary goals of the project was to help the Philippines meet CHED's (2010) Medium-Term Philippines Development Plan which in part strives to fight poverty and build prosperity for the greatest number of Filipino people. The end goal of the DES Project is to allow unemployed and underemployed persons gain access to education through distance education. This lofty goal has its challenges.

Internet access for end users may not be available or if available may not allow sufficient capability for optimal use. The challenges are numerous. At home it may be the prohibitive cost of hardware or access that acts as a barrier. By the developed world's standards computer hardware and software costs have dropped substantially but in developing counties this cost, for some, is still a hurdle. In some communities access may be available through internet locations such as libraries but in the smaller remote locations even this may not be an option.

Ideally the distance education program would also allow participants to continue upgrading during their time at sea. With seagoing contracts regularly in the nine-month range (Amante 2003) seafarers spend long periods away from home and although this would provide a tremendous opportunity to use the distance education delivery system in order to enhance education the quality and amount of internet access will vary.

Not all shipping companies will want to provide internet access. Access costs while at sea can be prohibitive with most ship owners unwilling to swallow that cost. Even those willing to provide the required access will need to contend with problems associated with technical support. Time is money and even along-side the dock and with vessels involved in activities such as cargo work ratings may endure long hours of work and little time to study or to find computer accessibility. The ship's owner may not always want to see productive rating gain the required education to move to officer status as one of the possible outcomes is that they then lose them to the competition.

Female ratings were identified as one of the underemployed seafaring groups within the Philippines. While the total number of females is smaller than their male counterpart this is an important group that could benefit through upgrading by providing additional funds to the family unit. Unfortunately females may continue to find it difficult to upgrade not only because of challenges as otherwise stated here but additionally because a high number will continue

their other occupation of raising a family once they have returned home on their off-time and with little time available to access and pursue further education.

Although there has been good collaboration throughout the project potential conflicts exist between the goals and responsibilities of CHED and the interests of the individual educational participants. CHED is responsible for all educational sectors in the Philippines and while the outcomes of this project will ultimately be of national benefit this government agency has numerous responsibilities that may impact the pace of distance education role out. Even within the group of participating HEIs there may be a varying pace in distance education implementation and that may cause some degree of distention or suspicion within that group. Those that proceed at a more rapid pace may be viewed as a threat to other institutions particularly if they attract participants from geographic regions normally serviced by others.

As the project progresses and eventually ends, the challenge will pertain to continued commitment of the partner institutions and project team members as well as keeping pace with the advances in technology which supports distance education. Access to new technology will be paramount. The project has provided the impetus to get to this stage in a timely fashion but without a coordinated and dedicated effort it is often difficult to maintain the same pace and interest. More normal duties placed on project participants is sure to demand more time once the project is at an end and there will be less incentive to continue this work. It will be incumbent on institutions to recognize the continued importance of distance education and to provide additional support to faculty and staff.

6. Benefits

There have been many benefits gained throughout this project and some of these have been emphasized in the project description. As noted the primary beneficiary of the DES Project is expected to be the end-users; seafarers enrolled in the offered programs.The modules to be developed are geared towards ratings who wish to continue studies towards becoming ship officers. The obvious benefit according to Amante (2003) is that officers on average make far more than ratings. Unfortunately there is a negative correlation between leave and pay in that those seafarers with longer contracts normally make the lower wages. The added benefit for the future ship's officers is that they not only receive the higher pay but are frequently rewarded with more leave time than the seafaring ratings.

According to an article by Guest (2010) one concern of ship owners who have hired Filipino officers has been the inconsistency in training to the point that a number of ship owners are now involved directly or indirectly in training Filipino seafarers. It is hoped that the results reaped from the DES Project would ultimately allow more control by CHED over content and delivery of the product, and a more rapid and efficient monitoring system. Of course a great deal of work will need to be undertaken to achieve these goals and efforts will need to continue well after the end of this project. However if quality management is made

integral to distance education then that will be a desirable outcome for CHED and for ship-owners as it will allow easier monitoring and enforcement of quality and will result in an improved and consistent end product.

The MET system is global and diverse. However with the advances in technology not only is it possible to interact with students globally but also with national and international faculty and institutions. With this flexible mode of delivery come the benefits and challenges of establishing international linkages and the ability to characterize and systematize transmission, utilization and expansion of knowledge and information. No longer will MET have to operate in isolation. The collaboration within this project is not unique but does demonstrate the ease that partnerships may form and grow. There are many other technologies including inexpensive voice over internet protocols (VOIP) such as Skype which can be used to facilitate these linkages.

The collaboration by the three primary partners quickly identified the need to determine and refine the framework and platform for distance education delivery. The D2L platform as demonstrated by MI is a versatile one with many benefits particularly for MI. In Newfoundland the government has introduced this platform to children in grade school and continues to use it in post-secondary education. It is a system that students there have used since the very beginning of their education and it has become a normal part of the life-long teaching and learning system.

However this is not the case in the Philippines and so an appropriate system needed to be sourced not only for the project but for more widespread usage. The identified system would have to be available to a large number of HEIs and not only in the maritime sector as CHED is responsible for all educational sectors both private and public. For this project the Moodle (2010) learning management system was identified and used due to a number of key benefits. This system is a free web application; relatively easy to use; open source; and conducive to creating effective distance learning sites. The additional advantage is that the project provided a testing ground for the system but it is the faculty and students that will continue to use and improve upon it. It is anticipated that at least partially because of this project a new distance education model will eventually be develop by CHED that will include this or a similar platform. It is hoped that through this participation MET will also have a greater understanding of the developing CHED distance delivery policy and standards.

The project's series of training-workshops has been beneficial to CHED and MET in terms of project management; policy development and distance education development and delivery. Staff members have gained experience in web-based project management and practices. There is an increased knowledge of sustainability requirements, such as financing, human resources, and an understanding of the importance of corporate and personal buy-in.

The project has supported several goals and national objectives of CHED. These include the enhancement of quality and accessibility of education. Skills will continue to be promoted in the maritime sector that will eventually help in the reduction of poverty; improvements in

upgrade training to officer-level qualifications; increased access to training for students from rural and remote and/or conflict affected areas; and increased opportunities for seafarers to continue working while upgrading their qualifications.

The project will have empowered MET in the Philippines with the necessary skills and expertise in delivering instruction and training through distance education. It has successfully chosen a platform that is able to accommodate a distance education program. JBLFMU, for its part, continues to recognize the benefits of distance education and has taken a number of steps to move forward with it including the hiring of an instructional designer to take care of the technicalities of their distance education initiatives. They have developed skills in adapting a curriculum for distance course delivery; gained skills in train-the-trainer and mentoring approaches; and gained information to plan, and model training projects. The project has also gained recognition from some European shipping companies as tangibly demonstrated by the donation of funds for a dedicated server to store JBLFMU's online courses.

The faculty of the other higher educational institutes will have also gained skills in adapting a curriculum for distance course delivery, and will have gained greater understanding of CHED distance delivery policy and standards. It is too early to determine which of these institutions will grow the distance education model - but no doubt at least some of them will.

7. Gender Equality and Student Involvement

Gender equality has gained widespread recognition, particularly in the western world. Equal pay for equal work; provision of adequate facilities; and non-discrimination in the hiring are some of the offshoots of gender equality. However there is still much work to be done in this area. The two educational partners both recognize the value of gender equality which is in part reiterated through the JBLFMU (2010) website which identifies that it is committed to promoting professional success among female seafarers and students through quality education, community involvement and other support initiatives.

The DES Project is also able to contribute to this goal through curriculum development. Emphasis has been placed on gender neutral language within curriculum development and also within the train-the-trainer workshops for other HEIs. This gender neutral language has been propagated throughout the seminars and participants will continue to use it within other areas of teaching including in the face-to-face methodology of teaching. Of course this language will also be seen and used by student participants who will continue to use it throughout their seagoing careers.

Student involvement is also an important aspect of the respective educational institutions. Accordingly student participation was incorporated and promoted within the project. Funding was solicited and received for various student activities. Three students were hired on a part-time basis to help with project logistics and that enabled them to gain experience in

project management for international development projects. One of the students developed a web-page for inclusion in the JBLFMU web-site on gender issues. This developed the student's skills in the area of web development while at the same time expanding her understanding and interest in gender issues with the added bonus of reaching out to a global audience through the power of the internet.

One Canadian student subsequently visited JBLFMU with MI faculty and took part in the train-the-trainer workshop for faculty but more importantly conducted two presentations to students, faculty, and administrative personnel (ACCC 2010). The interaction between the MI student and the JBLFMU students was very interesting to watch. There was lots of discussion, interest and even exchange of email addresses. This was pivotal in fostering educational and cultural interest and ongoing linkages among the students. In a large part due to the performance during these presentations this student was invited back later in the year by the Philippine Association of Institutions for Research (PAIR) to present at the International Research Conference 2010 (Alimen pers. comm. 2010).

A visit to Canada by the Philippine partners also involved a presentation to students which helped them to understand the educational system and more generally life in the Philippines. Interest in the Philippines has grown and an offer by JBLFMU to host two Canadian students as interns for a six month period in each of the next three years will no doubt be an easy one to fill (CIDA 2010).

The benefit of these events cannot be understated but is not always easy to measure. Some of the benefits of the events listed may be self evident but others such as a growth in self - confidence and other areas of personnel growth may be demonstrated later in life.

8. Conclusions

The shipping industry is an important one in the Philippines not only to the individuals employed in it but for the country as a whole and the number of persons employed and the number of MET institutions involved in that industry helps attest-* to this fact. It is important that every opportunity be given to the modern-day Filipino seafarer to be upwardly mobile within the industry and thus education is vital. It is hoped that The DES Project will play at least a small part in this process.

The project has helped faculty and institutions along the road to distance development and delivery, and allowed more interaction between MET and the government oversight agency. The importance of student involvement and gender issues while not always at the forefront to the extent that they should be in some areas of MET were realized in this project.
In any case it is important for MET and the related government oversight agencies to see the benefits of distance education. While not all institutions will have the same amount of buy-in it is anticipated that the ones that do, and more importantly the seafarers that take advantage of it will reap the rewards.

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Steering to Full Implementation of the 2010 STCW Amendments

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Abstract

The full review of STCW Convention and Code has been accomplished by IMO and the new amendment, which is also named as Manila amendment, will come into force in 2012.

In view of strong and great impacts of STCW convention upon the Maritime Education and Training (MET) systems, it is urgently necessary to review it so as to enable the MET to respond to it actively and successfully.

The paper analyzes changes in the new STCW amendment majorly to be affecting the MET systems such as those requirements in respect of certification, qualification of sea-going experience and special training. The paper provides finally some recommendations for the implementation thereof.

Key words: Maritime Education and Training (MET), STCW amendments, seafarers, certification, special training, sea-going experience, flexibility

1. Overview of the new STCW amendment

1.1 The changes

STCW 78/95, as an international convention specifically setting up standards for seafarers, was amended for the reasons of fast development of world shipping industry, more applications of new maritime technologies onboard, stricter standards in maritime safety and pollution prevention, more functions of human factors in maritime technical operations, and the latent flaws in the current version of the code.

Amongst the amendments adopted, there are a number of important changes to each chapter of the Convention and Code, including:

- Improved measures to prevent fraudulent practices associated with certificates of competency and strengthen the evaluation process;
- Revised requirements on hours of work and rest and new requirements for the prevention of drug and alcohol abuse, as well as updated standards relating to medical fitness standards for seafarers;
- New certification requirements for able seafarers deck and engine;
- New requirements relating to training in modern technology such as electronic charts and information systems (ECDIS);
- New requirements for marine environment awareness training and training in leadership and teamwork;

- Updated competence requirements for personnel serving on board all types of tankers, including new requirements for personnel serving on liquefied gas tankers;
- New requirements for security training, as well as provisions to ensure that seafarers are properly trained to cope if their ship comes under attack by pirates;
- Introduction of modern training methodology including distance learning and web-based learning;
- Complete revision of Chapter V;
- Simplification of celestial navigation standards;
- Addition of new requirements of VTS training for masters, chief officers and Officer Of Watch-keeping to utilize better VTS for maritime safety;
- Introduction of standards of electrical-electronic officer training;
- Incorporating compulsory BRM and ERM training requirements by transferring relevant requirements from section B-VIII/2 to A-VIII/2;
- Updated model courses such as the IMO model course 1.34 on Automatic Identification Systems, model course on Familiarization Training for Liquefied Natural Gas (LNG) tanker operations, basic training in marine environment awareness, model course for IBS, Liquefied Petroleum Gas (LPG) Tanker Cargo and Ballast Handling Simulator, Liquefied Petroleum Gas (LPG) Tanker Cargo and Ballast Handling Simulator.

1.2 The future development of STCW and impacts on MET

The amendments, throughout the process of review and debate, predicted to some degree the general future development of STCW codes, such as more focuses on special training (as proved by the complete revision of chapter V), maritime practical operations and emergency-responding skills of the seafarers, applications of overcomes of IMO activities as well as multi-discipline knowledge, "transparency" and higher efficiency of STCW-related management, international co-operations and informatization for MET management.

The amendment impacts directly upon the MET activities. The MET institutions shall:

- adjust and update curriculum, training syllabi, textbooks, etc,.
- update maritime training facilities;
- change academic management for the students;
- adjust or invent physical and medical standards for the students to be registered;
- maintain maritime instructors with sea-going experience;
- update the operations of quality system within MET institutions;
- plan their new strategic development.

The amendment brings also indirect impacts upon MET due to, for instance, the accordingly-changed national regulations for seafarer's certification, examination and assessment, the regulations for the quality system of Maritime Safety Administrations, the competitiveness of the MET graduates in the international seafarer manpower market.

2. Some major impacts upon MET

2.1 Certification Arrangement

To duly certify the students or trainees is the key aim of MET activities. Therefore changes in certification need to be diligently observed and handled by the MET institutions. It is a question about who will issue the certificates, what certificates are to be issued, how to

increase the efficiency of certification, how to arrange for the relationship between various certificates, how to balance certification requirements in terms of sea-going experience, approved MET programs and practical training, and what are the requirements for revalidation, etc,. In this outcome of review of STCW convention, all of those above have been affected.

For instance, the certificate can be categorized into three levels, i.e., Certificate of Competency (CoC), Certificate of Proficiency (CoP) and Documentary Evidence (DE). However, in some existing certification system, there may be some higher standards than the STCW. Ratings forming part of a navigational watch can be certified with CoC while the convention requires only a CoP. BRM training can be certificated with an independent CoP while the convention incorporates relevant requirements in the table of "Knowledge, Understandings and Proficiency"(KUP). The above hints that some new training courses will be created, some courses need to be updated and some courses may be phased out. For example again, the relationship between CoC and CoP has been established for the certification of some officers and engineers, which signifies that CoP courses must be done before the CoC certification.

The amendment may bring deepest changes in certification arrangement to some nations and thus affect the MET activities. The MET therefore has to respond with actions of the adjustment and updating of curricula, training syllabi, textbooks, etc,.

2.2 Flexibility

The amendment, as required by the principles of full review, created more flexibilities for the convenience of shipping companies and seafarers. The first type of "flexibility" can be seen in balancing "approved training" and "sea-going experience". For instance, Regulation III/1 provides that Engineer officers can be certified "when they have completed combined workshop skill training and an approved seagoing service of not less than 12 months as part of an approved training programme which includes onboard training which meets the requirements of section A-III/1 of the STCW Code, or otherwise have approved seagoing service of not less than 36 months". The second type of "flexibility" can be witnessed by "equivalent transferring". Able seafarers can be acquired from ratings with sufficient sea-going experience, and the Electro-Technical Officers can be transferred from "a suitably qualified person", or an Engineer officer certified as per the new amendment since the new amendment has incorporated electric and electronic KUPs into that of the engineer officers, except the exclusive training for ETOs according to Section A-III/6 "Mandatory minimum requirements for certification of electro-technical officer" of the code.

What should be the responses of MET system then? The above-mentioned flexibilities will of course lead to the diversity of MET training courses, the existence and development of MET programs, co-operations between MET and shipping companies, competitiveness of

students and trainees in different MET programs. The MET institutions should keep close watch for such.

2.3 Special Training

The complete revision of Chapter V such as the new regulation V/1-1 and V/1-2, and "competence requirements for personnel operating Dynamic Positioning (DP) systems"; "Training requirements for ships operating in ice-covered waters"; "Training requirements for personnel in charge of – or involved in – anchor-handling operations", and "Training requirements for personnel serving on board offshore supply vessels" signifies the close attention by the organization and industry and great potential of special training. Meanwhile, the said special training can be understood an aid for the achievement of "high-level, professional and specialized" MET.

However, to carry out special training programs relies upon the readiness of qualified maritime instructors, maritime training facilities, and an approved bank of maritime expertise.

2.4 Application of IMO achievements and multi-discipline knowledge

First of all, IMO has been devoting to a systematic safety framework for maritime safety, maritime pollution prevention and security through the SOLAS, MARPOL and other conventions and rules. Today, there are many new issues on technical applications for maritime safety such as the LRIT, GBS, GISIS, FSA and risk management, E-Navigation, Port of refuge, and in maritime pollution prevention aspect, such as:

- Ship-recycling
- Green-House Gas Emissions from Ships
- Ballast Water Management
- Noise from commercial shipping and its adverse impacts on marine life
- Formal Safety Assessment
- Human element
- Harmful anti-fouling systems for ships
- Implementation of the OPRC Convention
- Port of refuge
- …

All of those, understandably, require MET institutions to dedicate themselves to a comprehensive or "systematic" MET. At least, a modern qualified MET institution should be able to co-ordinate various maritime expertise and resources.

3. Summary and Proposed Strategies

The new amendments will be applicable in next 8-10 years by estimate. It will play important roles in keeping maritime safety and preventing pollutions at sea by guaranteeing the quality of people – seafarers onboard modern ships.

For MET institutions, the revised convention has set up new standards, bringing not only opportunities for development, but also challenges to the global MET system. For them, the

MET needs to be ready in all respects in particular training facilities and equipment, teaching staff, quality management and maritime expertise, etc,.

Therefore the MET system has to respond actively in many aspects. With understandings and awareness as above, together with those on the "quality shipping" and shortage of quality seafarer manpower, which is kept being indicated by the industry, the authors of the essay would propose the following:

3.1 Be Proactive in Implementing the New Amendment

The MET institutions shall analyze fully the new amendments and national laws and regulations, the implications of "quality shipping" and international seafarer manpower demand and supply. Then, take measures to respond them all, in a way of "implementing STCW amendment". So in such a case, the new amendment creates an opportunity to fully review and act to the environment where MET institutions are operated. The immediate strategies for MET institutions are such as:

- Assess the capability of the institution in implementing the STCW convention and codes;
- Fully review and modify the curricula and training plans for maritime courses;
- Upgrade training facilities, in particular for professional and special training, various facilities and installations such as LNG and LPG training facilities should be considered;
- Update the qualification of maritime instructors and teaching staff related;
- Speed up the formation of maritime expertise;
- Improve the quality management system;
- Plan new training programs for ECDIS, able seafarer deck and engine, electro-technical officer, 1000 Volts power station operation and maritime security.

3.2 Becoming Innovative and Encouraging to be "systematic" in MET

In addition to the "flexibility" brought by the new amendment, for which MET institutions have to be more innovative, the evolvement of maritime business also brings continuously new needs of MET. Innovation is also important to answer the new certification arrangement. As a detailed recommendation, MET institutions should introduce more tailor-made courses. But it relies upon the capability of the MET institutions.

To respond to comprehensive application of IMO achievements and multi-discipline knowledge, it might be worthwhile to recommend a "systematic MET" by developing disciplines and researches relating to maritime studies. It means in more details a cross-reference or utilization of multidiscipline maritime knowledge. Maritime students can thus be offered with a much more systematic and qualified maritime competency, such as a combined knowledge system with navigation, logistics, economy and maritime laws. It will contribute to the quality of MET, the creation of new maritime knowledge branches and applications and the capability of innovation.

3.3 Co-operating and Networking

The revised standards of STCW, the fast development and application of modern maritime technologies, the specialized and professional, or the requirements of the "quality shipping" as a whole are presenting a high level and comprehensive needs of "quality MET". But the number of maritime institutions which can provide "systematic MET" is small after all. For the vast majority of MET institutions, embarrassment will be encountered during the installation of training facilities and equipment, development of maritime human resources and maritime expertise.

Co-operations and networking between MET institutions are recommendable in such a case. However, the further considerations will be gone through in many nations, that is, how to map MET system world-wide or nation-wide?

4. Conclusions

The new STCW amendment is approaching to the world MET system, with aim to serve the industry better by more qualified seafarer. It is time to steer to its full implementation with full ahead.

However, an assessment for the comprehensive impacts exerted by the adoption of ILO MLC 2006, the comprehensive development of SOLAS, MARPOL and other international conventions and rules, shortage of qualified seafarers, the stricter PSC and FSC inspections, as well as the changing needs of the industry needs to be done, to see more clearly the picture that MET systems are facing with, and then, different MET institutions work with different pictures.

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Developing Cost Effective STCW 2010 E-learning Courses through International Cooperation, A case Study

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Abstract

Our most important goal as marine educators is to impart knowledge, information and skills that will allow our mariners to operate safely at sea in an ever-changing environment. Every day accidents happen on our oceans and we are reminded of the importance of our jobs and the need implement of strategies that will ensure safer oceans and **S**afety **o**f **L**ife **a**t **S**ea (**SOLAS**). As well as the new concept introduced by friend and collogue Prof. Jin, SMU "**H**appiness **o**f **L**ife **a**t **S**ea (**HOLAS**)" in his new maritime dictionary. (Jin Yongxing, 2008)

The most important factor in the safe operation of any ship is the experiences and competencies of its master and crew members. A well-trained and experienced master and crew can prevent maritime casualties by compensating for operational situations, the defects of their ship or the damages to their ship. Thus, an international standard of competency, the Standards of Training, Certification and Watchkeeping (STCW) for Seafarers 1978, as amended, was established to ensure that ships would be properly and efficiently manned. The STCW Code was amended in 2010, recommending the use of distance learning and e-learning for the training of seafarers, and established the guidelines for assessing their progress and achievements in Section B-I/6. The trainee's active participation in online learning, and self-directed management of their learning process, enhances their knowledge and understanding of safe navigation and environmental protection.

This amendment of the STCW has opened the door for institutions to develop online learning implementations to assist their students in obtaining the knowledge and skills needed for advancement and to improve safety at sea.

Keywords: distance learning, e-learning

1. Introduction

Distance learning has been described as "a process to create and provide a way of approach to learning when the students and the source of information are separated by distance and time, or both." It is a field of education that focuses on the pedagogy, instructional, and technology system designed to deliver residence courses to students who are not physically "on site" in a student-centered classroom. In short, distance education courses offer educational experiences of equal quality to students that best suits their demands

outside the classroom, further, they may require a short-period physical on-site presence for some reasons (including taking examinations), this type of course is considered a hybrid or blended course of study.

With recent technological advances, computer-based distance learning, known as e-learning, programs can be rapidly revised and disseminated giving users more freedom of choice in time and location for their learning. With the exponential expansion of network access world-wide, coupled with the development of cross-platform standardized tools for multi-media and hypertext access, complex distance learning programs are able to reach farther and wider than ever before. As this emerging technology is becoming widely used in universities and institutions, computer-based e-learning is becoming more recognized for its potential in providing individualized attention and communication with students internationally. According to the Sloan Consortium report 2006, there were more than 96 percent of the largest colleges and universities in the United States offered online courses and there were almost 3.2 million U.S. students who were participating at least one online course during the fall 2005 term.

Increasingly rapid changes in the maritime work environment are bringing about a need for periodic retraining. There is a growing demand for seafarers with diverse and continually progressing knowledge and skills. Seafarers, who work far away or at sea, especially need to be able to begin MET courses at any time and any location, rather than at the beginning of the conventional semesters and on campus. Many of these distance learners who are older than conventional campus students, and they are usually self-directed, experienced, and motivated by extrinsic factors such as professional promotion and salary. Hence, in 2010, the amended STCW Convention was recommending the use of distance learning and e-learning for the training of seafarers, and established the guidelines for assessing their progress and achievements in Section B-I/6. Any approved MET course allowing the training of seafarers by distance learning or e-learning in accordance with the standards of training and assessment set forth in section A-I/6 should have clear instructions, professional tutorial support, systematical reflect what trainee has learned, as well as providing learning outcomes that meet all requirements. Further, approved assessment procedures should be provided for any distance learning or e-learning MET course. The trainee's active participation in online learning, and self-directed management of their learning process, enhances their knowledge and understanding of safe navigation and environmental protection.

This case study examines the e-learning implementation and strategies adopted by National Kaohsiung Marine University, Kaohsiung, Taiwan and Maritime Institute San Diego, California, USA to comply with STCW 2010 recommendations from the perspective of international cooperation to achieve three common goals:

1) Providing greater access to educational opportunity for Maritime Students;
    a. Understanding of e-learning potentials
    b. Implementing affective nationally approved e-learning courses.
2) Enhancing the quality of learning for mariner's at sea;
    c. to achieve their education and training goals in the marine industry using e-learning
    d. to improve safety at sea.
3) And reducing the cost of higher education for the institution and the student.
    e. Implementing a cost effective program using MOODLE, a free open-architecture e-learning management software
    f. have limited financial and time resources allocated to staff training

2. Background

Maritime Institute of San Diego (MII) is an accredited two-year degree granting institution in the state of California, USA. We are a small but progressive institution offering a two-year degree program, Coast Guard and STCW 95 approved courses. Maritime Institute is unique in the maritime education industry in that 90% of our students are currently employed in the maritime industry, and have an average of age of 35.

National Kaohsiung Maritime University (NKMU) is internationally recognized post graduate degree granting Maritime University located on the south end of the island of Taiwan; it is one of two maritime schools in Taiwan providing Maritime Education and Training (MET) to the populations of students, seafarers and shipping industries.

Distance is no longer the sole reason for attending an online course; flexibility of access times, as well as cost effectiveness is of significant importance. Students attending courses through the Internet want to be in control of when they access their courses and to choose when and how they interact with their instructors and even classmates. In short, students want flexibility. Because online courses require different preparation, infrastructure, technical support, technology expertise, and course providing, evaluation of student online course experience(s) also requires a different evaluation paradigm.

In the summer of 2009, as part of an international academic cooperation program, four NKMU students were selected to participate in the online course, "Rule of Road", and received an e-mail invitation from MII. A NKMU instructor was assigned to perform as a co-instructor to assist the students on site, further evaluate the students' outcomes and to administer final examination. During a three-month period, students had to read the textbook and then watch the online teaching materials for better understand of the subject. The course gave students a quiz at the end of each chapter to control and to evaluate the performance of the students. In the meantime, an e-learning course of Rule of Road in Chinese format was created, completed and distributed to the Shipping Technology Department NKMU.

In our efforts to implement cost-effective training programs, we have found that it is important to build alliances with other colleagues from many disciplines that believe in working together to achieve educational goals because they are professionals and it is the right thing to do. We have built an alliance which includes institutions in Taiwan, China and the United States that work together at all levels to improve education within the normal work schedule, thus decreasing the costs of cooperative teaching programs, courseware development and developing e-learning programs.

3. E-Learning Design Considerations

First and foremost it must be understood that e-learning technologies and its implementation are a relatively new technology that we can use in order to reach our clients and students, it is not the panacea that many schools feel it is. We are seeing many schools are implementing online strategies as a major part of the curriculum or as 100% of the curriculum because of the financial gains they see possible and in our opinion in many cases forgetting the student. We implemented our e-learning courses to provide greater access to educational opportunities for maritime students at sea and augment our traditional on campus courses.

3.1 The laws and regulation that we must be compliance with when developing an online course

If we want our courses to be recognized by the member states and the companies which will be employing our students it is imperative that we do extensive research into all laws and regulations governing our schools and the introduction of new courses and modalities. Thus, first step prior to designing or implementing any course is to ensure that we have a complete understanding of all the requirements and regulations, so that course will be acceptable once you are designed. The maritime training industry is unique in that we are required to comply

with many more regulations than the traditional educational institution. We must comply with IMO, STCW Convention, and State requirement such as the code of federal regulations used in the US for the maritime industry in addition to all federal, state and local education regulations. We have listed some of the regulations that must be considered prior to designing and implementation of the course below:

IMO/ STCW Section B-I/6. (E-learning course regulations)

US code of federal regulations 46 CFR parts 10 and 11 (course implementation regulations), 46 CFR part 11.910 (subject matter area requirements)
National educational accrediting agency regulations (course approval for academic accreditation)
Federal, State and Local education regulations (Department of education and work of education regulations)
International/federal copyright regulations

3.2 The developer

The instructors are the subject matter experts and will always be the driving force in the development of courses and programs. We agree with Ms. Oblinger, "A more effective model is to pair a faculty member with an instructional designer so that each brings unique skills to the course-creation process." (Oblinger , 2006), it is important that we bring together a cadre of experts in the field of online course development, but in today's austere world of economic crisis educational institutions have little or no money to develop and implement these important online strategies. Yet, the very technology that allows us to conduct online courses can also bring together colleagues for collaboration on the design and implementation of the very same e-learning courses over great distances. The developers must be reasonably proficient in computer and Internet skills.

3.3 Choosing A Course Management System

During our research phase, we reviewed both vended and open source solutions determining that there are basically two major Learning Management Systems (LMS) Blackboard (Web CT and Vista) and Moodle with market shares up 45% and 54% respectively. (Sakai, 2009) "Moodle doubled its market share in the past 12 months and now has the highest market share after Blackboard/WebCT in this market segment" (Feldstein, 2008) We contacted several schools that are using each of these modalities and interviewed individuals in their online learning management departments. The results of the interviews were similar to that of talking to individuals who are Apple computer users and those that use Microsoft-based PCs; you do not come away with a definitive answer. It is important for them to justify the systems that they have chosen because of the enormous costs involved in maintaining the systems once implement. Thus, we decided to contact some of our colleagues at these institutions and asked them if we could implement a test course on each of the systems. The test course chosen for the test implementation was the "International Regulations for the Prevention of Collisions at sea". (USCG and IMO, 2009)

Our overriding concern was can an open architecture Course Management System (CMS) that is free be used in to implement all of the current online course design strategies that we consider to be important in a modern day online e-learning course. We reviewed the research papers and information on the web a found the opinions to support our own findings, "The evidence gathered by this committee strongly favors a transition to Moodle on both pedagogical

and financial grounds. Moodle provides better or comparable functionality with the benefit of increased relevance and control for what in the long run will be lower cost." (Feldstein, 2008), "Moodle is user friendly and will provide comparable functionality for faculty, staff, and students while providing the added benefits of flexibility, customization, and product control and cost savings". (Dr. Croy, and Smelser, et al, 2008)

Our test implementation confirmed our earlier research of current literature and online discussions that Moodle is more than adequate to meet our needs. We found that both course management systems performed adequately, but Moodle is being accepted and implemented at a phenomenal rate because of its versatility and cost. This growth is shown in figure 1 below.

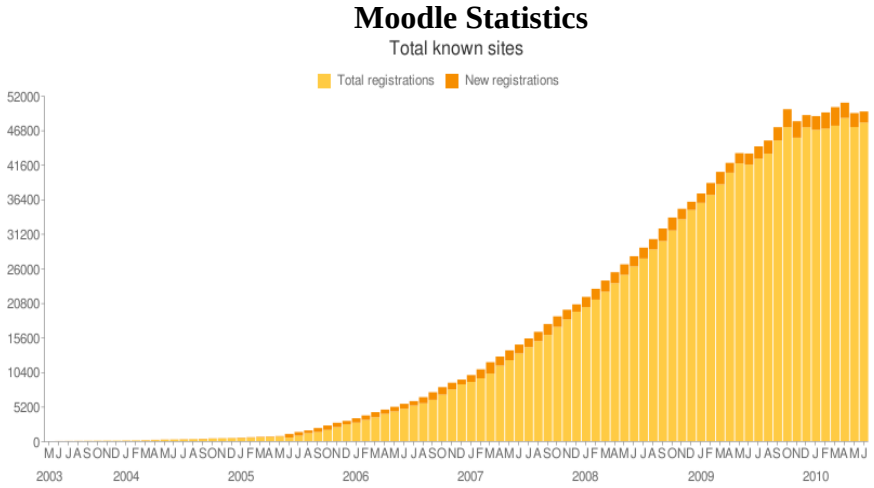

Figure 9. Moodle Statistics from www.moodle.org

3.4 Tools That We Find Useful

1) Moodle 1.8.13 (Windows implementation)

Moodle is an Open Source Course Management System (CMS). It has become the most popular CMS among educators around the world as a tool for creating online courses and web sites for their students. The program is available in all virtually languages and for all platforms. We have since upgraded to Moodle 1.9.9 the most current version.

The Moodle project gives educators the tools to develop, implement, manage, and also we e that is in some promote learning. It includes all tools required to design and implement an online e-learning course. Any instructor with a basic knowledge of PowerPoint, Word and the Internet can learn to use these tools in a very short time. Implementation assistance is provided via the mooodle.org website.

2) **Camtasia Studio Ver.** 6

Camtasia Studio gives you the power to easily record your screen, PowerPoint presentations, voice, and Web camera video to create compelling video tutorials, training presentations, and rich sales demonstrations for Web and CD-ROM delivery. We found the program allowed greater copyright security of our videos. This was the only product purchased as part of the project.

3) **Microsoft office 2007**

Word, Power Point and Publisher all support HTML web page generation and provides most basic tools necessary in the development of content for your e-learning course.

4. Implementation

Since, our initial trial July 2009, we, MII, have implemented 11 courses, eight of which have been approved by the Maritime Administration, Department of Education, and Accrediting agencies. Additionally, because of the cost effectiveness of online courses we are able to offer them at 23% discount to our students over the normal cost you our on-site courses.

Web-based MET courses at NKMU have been available for delivery on the internet since November 2009. NKMU started with the "International Collision Prevention Regulations" course of for their initial trial. While being delivered through the internet, the course is taught by an instructor using the technology of Microsoft Office PowerPoint. The massive amount of online reading material required chains students to their computers and dulls their thinking, a good textbook is recommended to supplement student's offline study. Assignments are submitted online by students to instructors, and a final examination is completed on site to provide a link between learning, instruction, and assessment of the students' success and to ensure accurate measurement. The enrolled students not required to pay the tuition fee during this initial design and implement stage.

5. Benefits

The benefit of distance education offers at least five major categories, as follows.

1) Expanding access opportunities: Distance education can reach underserved populations of students who are not able to join a school that provides the residence courses they desire, perhaps because they live/work too far away or at sea.

2) Cost effectiveness: Distance education can turn production of content into a permanent and repeatable learning tool that does not require as much infrastructure. As most material can be packaged in an easy to send "just-in-time" format, the additional expenditure of educational institutions becomes unnecessary.

3) Emerging market opportunities: Distance education supply's the shipping industries' need for on-the-job or lifelong learning in maritime education and training by offering access to candidates who are on board ships at sea.

4) Adapting to new technology and environments: MET schools may adopt distance education as a means to adapt to the rapid changes in technology being used in education nowadays.

5) New fund-raising opportunities: Distance education produces new graduates who might be willing to donate money to the school who would have never have been associated with the school under the conventional education system.

6. Summary and Conclusions

The implementation of online courses has allowed us to serve our clientele, who are at sea or serving in foreign ports. The courses have allowed the students to continue their education, improve their skills and knowledge and improve safety at sea. Additionally, we were able to implement the courses economically by mobile and open source learning management system (LMS) and by building a cadre of colleagues from many locations that are experts from all the required disciplines which are willing to work together to achieve a single goal important to all of them.

It is just beginning for us to understand how to offer courses online. We may never be able to halt the increasing rate at which we are offering online courses in today's market. These courses will be provided more and more by the industry, regardless of outcomes, but we can ensure that we improve our outcomes through developing international cooperative programs using appropriate distance pedagogy in courseware development, teaching and e-learning programs while decreasing the costs. If we do not seize this opportunity, we may

end up with a generation students who have failed to grasp and understand the knowledge as well as skills they need to succeed in their work; indeed, in their daily lives.

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The Impact of the Revised STCW Convention on Maritime English -Tightening the Communicative Competence Provisions

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Abstract

The review of the IMO STCW 78 Convention as amended in 1995/97 reached its climax at the International Diplomatic Conference held in Manila in late June, 2010 when the amendments were adopted. The result of the process, that has been on-going since 2006, will have an immediate impact on Maritime Education and Training as the "new" convention enters into force already in 2011. Although the fundamental principles of the 1995 edition have been retained, many regulations have been tightened and new areas included; with the outcome that the new edition reflects the higher standards to be met in the field of MET in general, and in Maritime English communication competency, (and thus on Maritime English instruction and research), in particular.

This paper/ presentation will, with regard to Maritime English,

- observe IMO's decision-making process, and
- identify and comment on the new provisions in the Convention and the existing provisions that have been invested with a stricter and higher degree of commitment.

Key words: Communication, Maritime English, Competence, revised STCW Convention.

1. Introduction

The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, (STCW), 1978 has been revised. On June 21, 2010, after more than four years of intensive and worldwide discussions and debates at conferences, workshops, within IMO and on various other occasions, the Manila Diplomatic Conference on the STCW Convention approved a number of significant amendments to the STCW 1978 (as previously revised in 95) Convention. The so-called "Manila Amendments", will now undergo the prescribed IMO ratification procedure until 01 July 2011, and then enter into force on 01 January 2012.

While it may seem desirable that the approved new inclusions and amendments to the Convention should be enforced immediately, the delay until 2012 is partly designed to allow member states and their institutions time to prepare for the changes. This naturally applies to the Maritime English community that is well advised to carefully and in depth consider the corresponding new or amended requirements regarding Maritime English and maritime communication of which there are many. The sooner we identify the greater demands on Maritime English instruction and research, the better position we will be in to satisfy the new provisions and thus the complex requirements of the maritime industry. This in turn will impact on the design of our Maritime English courses, their curricula and materials development, the assessment tools to be used and even the training of Maritime English teachers.

In this context it is worth noting that the predecessor to the Manila Amendments (STCW 1978/95) set higher demands first of all on the nautical and technical fields. It gave, for example, special attention to realizing competency-oriented rather than purely knowledge-based MET and assessment (Trenkner 2009) leaving, however, further room for improvement as far as Maritime English instruction for deck and engineer officers is concerned.

Regarding Maritime English it is interesting and gratifying to note that this important issue has played an ever growing part regarding the three successive versions of the Convention, i.e. STCW 1978 via STCW 1978, as amended in 1995, and culminating with the Manila Amendments of 2010 which are dealt with in greater detail below.

We feel that IMLA 18 and the forthcoming IMEC 22 are well established forums qualified to consider the corresponding objectives and to start a serious discussion of the tasks to be done in order to meet the requirements of the Convention as defined by/ detailed in the Manila Amendments.

2. The IMO Decision-Making Process

The International Maritime Lecturers Association has been represented at all stages of the STCW review process, and has such been able to monitor and influence the

decision-making process. At the Sub-Committee on Standards of Training and Watchkeeping meetings all the 169 IMO member states have had political, legal and technical representatives present as have most of the consultative 58 Intergovernmental Organizations (IGOs) and 75 Non-governmental Organizations (NGOs); around some 500 persons present in total.

It is not an easy task for the outsider to fathom out the procedures, search for the relevant documents being discussed and understand the terminology. Even locating the various sessions with plenaries, working groups drafting groups and the topics they are dealing with can be a challenge. At times decisions are made at great speed, at times an hour or so is spent on one seemingly small point. However, despite the enormity and complexity of the task, decisions are inevitably realised and the day's agenda completed, even if this means early starts and late finishes. The secret to success, is the vast amount of preparatory work done between STW meetings where agreements are made and co-sponsors identified in order to facilitate the decision making process.

There are times, nonetheless, when decisions are not straightforward, and groups gather during the breaks and after the sessions to hammer out acceptable solutions. In the event of a non-conclusive resolution and this occurs occasionally, the matter is forwarded to the next meeting, and finally to the Diplomatic Conference, with the hope that unanimity is reached within the meantime.

At the 41st Sub-Committee meeting on Standards of Training and Watchkeeping, held in January 2010, IMLA had tabled a Note Communication on board to strengthen Regulation 1/14 Responsibilities of Companies. At the first day's plenary this was referred to the Working Group dealing with Chapter 1 General Provisions. Worth noting perhaps is the Working Group for Chapter 1 began its task on Monday afternoon, resuming at 09.00 on Tuesday, and reaching the item at 19.34 in the evening, where the Note was referred to but a further discussion on it was regarded as unnecessary since the previously accepted amendment from STW 40 was seen to be sufficient (c.f. section see 3.1 below). Clearly, if IMLA is to have a real impact in fashioning change "co-sponsorship" is essential, viz getting Member States to guarantee their support in writing; proposals from NGO's alone are rare. Nonetheless, it is worth mentioning that our ideas have in principle been allowed for as reflected in the Convention especially by the reference made to the SOLAS Convention (2004). Furthermore, there were a number of amendments accepted that directly refer to or imply competence in Maritime English, as presented below.

One further item worth noting was the inclusion in the agenda of lunchtime presentations of which one contribution from Poland was entitled Do we need standards for Maritime English?. This possibility clearly provides a window of opportunity to influence decision makers at the highest levels and is worth IMLA bearing in mind for future occasions.

Regarding future IMO meetings it is invaluable to have experienced IMLA delegates present who are familiar with the process of IMO decision making. Further, for those

interested in gaining experience and understanding the procedures of their national representatives in fashioning the legal background behind the standards of maritime education and training which guide our daily endeavours, IMLA, as a consultative NGO at IMO, opens the door.

3. The Manila Amendments

In the following first sub-section the Manila Amendments resulting in new or amended requirements to Maritime English in general are introduced and discussed. In the second sub-section the specific requirements regarding Maritime English as laid down in the amendments are identified and commented on. Only the sections involving the STCW Operational and Management level of the Code Part A are considered. Due to space limitations the chapters of the Convention covering tanker operations, passenger ships, crisis management, medical care and security duties are not included here even though they are also of importance and should thus not be neglected.

3.1 The Maritime English Requirements in General

Despite certain attractions it was never the intention of the IMO to create an entirely new Convention. The philosophy for the review as developed at STW 38 (IMO 2007) included eight principles, two of which read:

- retain the structure and goals of the 1995 revision
- not to amend the articles of the Convention.

This infers that the parties involved in the reviewing process were not given an absolutely free hand in this respect, but were conditioned or guided, and their ideas and initiatives channelled.

At least one of the eight basic principles mentioned above was highly relevant for our subject: Requirements for effective communication.

IMLA and especially its International Maritime English Conference (IMEC) also felt challenged and saw that certain shortcomings in the STCW 1978/95 Convention identified by the Maritime English teaching community were worthy of the IMO's consideration, and the Conference enriched the corresponding discussions with purposeful suggestions.

The following amendment in particular entails far reaching advantages for Maritime English as a subject of instruction and research and its reputation as a comparatively newly established knowledge area. The corresponding sentences read:

Regulation I/14

Each Administration shall require every company to ensure that: at all times on board ships there shall be effective oral communication in accordance with chapter V, regulation 14, paragraphs 3 and 4 of the SOLAS Convention.(IMO 2010)

There are at least two items in these tersely worded lines which, however, will have an immense impact on Maritime English as a subject of instruction and research.

Firstly, the modal verb "shall" as used in the regulation mentioned above postulates the highest degree of commitment in legal contexts, e.g. conventions, laws, decrees, regulations, provisions, etc., indicating orders or instructions. This means that the clientele to which this regulation applies has to meet the requirements set out as it is not a matter of discretion whether to do so or not. Consequently, Regulation I/14/.7 essentially strengthens the position of Maritime English lecturers and indeed the role of the subject as well.

Secondly, the reference to the SOLAS Convention (2004) made above is of utmost importance for the future development of Maritime English both for MET institutions and for the maritime industry and here especially for the complements of the active fleets and their shorebased services such as Vessel Traffic Services (VTS) and allied emergency services. The SOLAS regulation referred to reads:

English shall be used on the bridge as the working language for bridge-to-bridge and bridge-to-shore safety communication as well as for communications on board between the pilot and bridge watchkeeping personnel. (IMO 2004)

Here again the modal verb "shall" is wisely used with the implication described above, and this regulation is entirely in line with our IMEC policy and provides a solid legal foundation both for our work in class and for our research as well. Furthermore, it does away with the occasionally advanced argument that IMO has avoided specifically naming English as the binding language of seafaring in its legal documents. As a result, this essential regulation is highly usable at MET institutions and elsewhere, whenever the legal authority of Maritime English, its teaching and its teachers come into question.

Analysing the wording of the regulation the idea suggests itself, that a simple editorial amendment could give the whole regulation a more comprehensive impact. Inserting a comma or alternatively the conjunction "and" after the words "communications on board", this regulation would then actually cover, together with the corresponding Manila Amendments, the most important spheres where English is used in ship-to-ship, ship-to-shore (and vice versa) communications, in on-board communications and in ports. This quite possibly may even reflect the original intention of the authors of SOLAS. However, implementing this at IMO, where the issue has already been broached, would require a new work programme item sponsored by a Member Government; IMLA as an NGO, cannot propose such an alteration. This purposeful suggestion has to be handed to an interested Member Government to accommodate it in a paper to the Maritime Safety Committee as a new work programme item; this being the melody of drafting documents within the Organization.

Moreover, the SOLAS regulation advises the use of the IMO Standard Marine Communication Phrases (SMCP) in the contexts outlined. This advice goes back to a proposal of the USA delegation to IMO and strengthens, furthermore, the part the SMCP plays in

maritime communication and thus in promoting safety at sea and in ports. Moreover, it also speaks well for the editorial amendment highlighted above.

3.2 The Maritime English Requirements in Detail

In the new document there are a number of amendments or requirements that directly refer to or imply competence and proficiency in Maritime English. These are all derived from the more general requirements dealt with before and have to be allowed for in Maritime English course design and instruction. They will also provide essential impetuses to research and deliver demanding challenges for workshops at IMLA conferences and IMECs of the future.

The requirements in question are laid down in the Tables to the STCW Code Part A retained from the structure in STCW 1978/95:

- Column 1: Competence
- Column 2: Knowledge, understanding and proficiency
- Column 3: Methods for demonstrating competence
- Column 4: Criteria for evaluating competence

In the following a number of the most important items are identified and discussed.

The necessity to ensure effective communication in its diverse manifestations in various nautical and technical spheres is explicitly expressed in the amendments. Whenever the term "communication" appears it can be taken for granted that language communication using English is meant recalling that multilingual crews, where English is the working language, are the rule and rarely the exception in international shipping today. In the extracts from the revised STCW that follow the amendments are **highlighted**.

Table A-II/1

- Column 1: Maintain a safe navigational watch

Bridge resource management

- Column 2: **.2 effective communication**
- Column 1: **Use the IMO Standard Marine Communication Phrases and use English in written and oral form**
- Column 2**:** …to communicate with other ships, coast stations and **VTS centres**
- Column 4: **Communications are clear and understood**
- Column 1: Monitor the loading, stowage, care during voyage and the unloading of cargo
- Column 2: **Ability to establish and maintain effective communicatio during loading and unloading**

- Column 1: Inspect and report defects and damage to cargo spaces, hatch covesr

And ballast tanks

- Column 2: **Ability to explain how to ensure reliable detection of defects and damage**
- Column 1: Watchkeeping
- Column 2:**The use of reporting in accordance with the General Principles fo Ship Reporting Systems and with VTS procedures**
- Column 1: Application of leadership and teamworking skills Knowledge and ability to apply effective resource management
- Column 2: **.2 effective communication on board and ashore**
- Column 4: **Communication is clearly and unambiguously given and received**
- Column 1: Coordinate search and rescue operations
- Column 4: **Radio communications are established and correct communication procedures are followed at all stages of the search and rescue operation**

Apart from the non-specified requirement of effective communication, at least four issues in the amendments are of great significance:

Firstly, besides the use of the SMCP, English in written and oral form has to be taught/learnt and mastered. In this way the communication skill of "writing" is given much higher priority than in previous Conventions.

Secondly, communication with VTS centres is now fortunately accommodated in the Convention. That this has not been done in previous versions of the STCW is astonishing since communicating with VTS centres is one of the most frequently performed exchanges of information on the radio for ships officers and is comparatively demanding. Our experience shows that this issue has been part of the Maritime English syllabi at many MET institutions although it has never been required by the previous Conventions.

The amendments also require Maritime English lecturers to familiarise themselves with Ship Reporting Systems (e.g. MAREP), the corresponding Radio Regulations and the decreed VTS procedures. To do this is reasonable and manageable for a Maritime English lecturer and is, in fact, facilitated through the corresponding chapter of the SMCP (IMO 2002) where VTS communications are covered.

Thirdly, that effective communication ashore is also mentioned is a further plus in the amendments as the communicative mastering of the interface "ship x shore" is now on the agenda; for example, in cargo handling operations and cargo care, where for the latter descriptive communication skills are required.

Fourthly, the clear reception of communication is furthermore mentioned thus emphasizing the development of another communication skill, listening, the importance of which has been somewhat underestimated in the past.

Table A-II/2

- Column 1: Respond to navigational emergencies
- Column 4: **Communications are effective and comply with established procedures**

The technological/procedural aspects of radio communication and its Maritime English requirements appear as one complex item now thus reflecting the reality of seaborne radio traffic. Here again, for Maritime English instruction the appropriate Radio Regulations and the procedures as laid down in the IAMSAR Manual (IMO/ICAO 1998) have to be allowed for. As far as SAR operations are concerned, the SMCP provides a comprehensive set of corresponding communications (IMO 2002/1).

Table A-II/5

- Column 1: Contribute to a safe navigational watch
- Column 2: **Ability to understand orders and to communicate with the officer of the watch in matters relevant to watchkeeping duties**
- Column 4: **Communications are clear and concise**

It is an appreciable novelty that the complex face-to-face bridge conversation is given room in the amendments. This may well be extended, e.g., to the watch officers' conversations performed during cargo handling operations. The SMCP is helpful in this respect, too (IMO 2002/2).

Table A-III/1

- Column 1: Maintain a safe engineering watch

Engine-room resource management

- Column 2: **.2 effective communication**
- Column 4: **Communication is clearly and unambiguously given and received**
- Column 1: Application of leadership and teamworking skills
- Column 4: **Communication is clearly and unambiguously given and received**

Table A-III/2

- Column 1: Use leadership and managerial skills
- Column 2: **.2 effective communication on board and ashore**
- Column 4: **Communication is clearly and unambiguously given and received**

Table A-III/5

- Column 1: Contribute to a safe engineering watch
- Column 2: **Ability to understand orders and to communicate with the officer of the watch in matters relevant to watchkeeping duties**

- Column 4: **Communications are clear and concise**

Table A-III/6

- Column 1: Use English in written and oral form
- Column 2: **Adequate knowledge of the English language to enable the officer to use engineering publications and to perform the officer's duties**
- Column 4: **English language publications relevant to the officer's duties are correctly interpreted Communications are clear and understood**
- Column 1: Use internal communication systems

Operation of all internal communication systems on board

- Column 4: **Transmission and reception of messages are consistently successful**

Communication records are complete, accurate and comply with statutory requirements

- Column 1: Application of leadership and teamworking Skills
- Column 2: **.2 effective communication on board and ashore**
- Column 4: **Communication is clearly and unambiguously given and received**

Summing up the requirements of Table A-III dealing with engineering duties, it is noted that the improvement of the communication proficiency among the engineering staff is laudably given sufficient attention. The corresponding requirements cover all the four communication skills (reading, writing, listening and speaking) which is of an enormous benefit compared to the preceding versions of the Convention where Maritime English instruction for engineering officers played a minor part - this was one reason why Maritime English for engineering students has been badly underestimated at many MET institutions.

Having welcomed and appreciated the new requirements regarding Maritime English it must, however, be stated that any kind of systematic principles according to which communication skills, in whatever form , are assigned to the different nautical or engineering requirements, cannot be detected. It may be asked why, e.g. for "Berthing and unberthing operations", for "Actions to be taken to protect and safeguard all persons on board in emergencies" and for many other items, no communication requirements are explicitly listed. A kind of ideological fallacy might occur in this respect, especially among less experienced Maritime English teachers who could be left with the misleading idea that the explicitly mentioned requirements reflect the entire contents of their instruction. A more elegant and consistent approach would have been imaginable, but we have to cope with the facts given and what now matters is the creative implementation of the Manila Amendments. The lengthy Convention has still to be studied carefully for further "hidden" requirements and interpretations where the need for a sound command of Maritime English is required. The new version of the Convention does, however, nonetheless demonstrate significant progress

in tightening the communicative competence provisions when compared with its predecessors.

4. Conclusions

The Manila Amendments are the result of nearly five years of intensive debates and discussions on various occasions also at the annual IMLA conferences and at IMEC gatherings. Although the outcome is not the optimum, it is, however, an acceptable and practicable instrument suited to further develop Maritime English as an essential but relatively new knowledge area in order to satisfy the new provisions and thus the complex requirements of the maritime industry. Now it matters not to waste time but begin to adapt, update or newly develop the curricula of Maritime English courses, the teaching materials and assessment tools in order to embrace the new or amended requirements set out in the Convention. Appropriate methods should be applied as discussed and promoted at our conferences and in IMO's Model Course 3.17 as, for example, content-based teaching/learning based on a communicative approach. Furthermore, Maritime English lecturers need also to be qualified to enable them to meet the demands set out (Cole, Pritchard, Trenkner 2005), thus highlighting the need for certification through teacher training courses. Last but not least, an appropriate assessment tool has to be developed and a standard yardstick adopted (Cole, Trenkner, 2009) in order to make an instrument available to MET institutions and the industry suited to reliably assess and measure the communication performance of students and/or officers. All this is no easy task but necessary not only to satisfy the new provisions but also to simply benefit our students by enhancing their safety in the fleets they will serve and the safety of shipping in general.

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The Background, Details, Impact and Performance of Training cannot be conducted on board in STCW78/10 amendment chapter VI

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Abstract

Comprehensive reviewed every STW conference from STW 37, traced the background of training cannot be conducted on board and analyzed its details, then dissected the impact of STCW78/10 amendment on Maritime Education and Training institutions, finally performance measures on Training cannot be conducted on board for relevant institutions were come up.

Key words：STCW78/10;Training cannot be conducted on board; background; details; impact; performance

1. Introduction

Major revisions to the International Convention on Standards of Training, Certification and Watch-keeping for Seafarers (the STCW Convention), and its associated Code have been adopted at a Diplomatic Conference in Manila, the Philippines, from 21 to 25 June 2010, "The Manila amendments to the STCW Convention and Code" are set to enter into force on 1 January 2012 under the tacit acceptance procedure and are aimed at bringing the Convention and Code up to date with developments, thereby ensuring that the necessary global standards will be in place to train and certify seafarers to operate technologically advanced ships for some time to come. Training cannot be conducted on board in STCW78/10 amendment chapter VI will be in force in the same time.

2. Background

In 2005, originally, MSC80 had considered the proposal of Norway that a comprehensive review of requirement on demonstrating maintained professional competence in STCW Chapter VI. Philippines proposed review the column 3 of Specification of minimum standard of competence in STCW Code chapter VI and distinguish items cannot be conducted

on board and participate in short-term training courses to update their knowledge for maintaining competence on these training. Norway (STW37/17/5) expressed some training cannot be conducted on board such as fire drill. The Sub-Committee approved should first identify the areas in chapter VI of the STCW Code where training cannot be conducted on board. MSC 81 endorsed the decision of STW 37 that added a new item "Identification of areas in chapter VI of the STCW Code where training cannot be conducted on board" to work programme of STW 38. In STW39, the proposal from the Islamic Republic of Iran and Norway had reviewed STCW Code VI/1 to section A-VI/5, discovered some training cannot be conducted on board and list these items. STW39 Sub-Committee had approved the list which improved by workgroup on the basis of proposal from the Islamic Republic of Iran and Norway, and then attached it on report to MSC84 as an attachment, and submitted it to Committee for approve. In 2008, MSC84 had approved the list which agreed by STW39, and instructed the Sub-Committee to consider training cannot be conducted on board in STCW code chapter VI measures to ensure compliance with the requirements in the STCW Convention, to maintain professional competence in these areas. STCW/2010 amendment requires crews to provide evidence that demonstrating maintained professional competence on these items every 5 years.

Methods for maintaining professional competence on Training cannot be conducted on board in STCW78/10 amendment chapter VI involved amendment on STCW78/10, now detail the items of Training cannot be conducted on board as following.

3. Details of Training cannot be conducted on board

3.1 Training cannot be conducted on board in personal survival techniques

In the competence of surviving at sea in the event of ship abandonment, safely jump from a height into the water is impracticable, because of the waters around the factors threatening the safety of this practice of the presence of unsafe. Right an inverted life raft while wearing a lifejacket is impracticable, because closed packed life raft only be used in emergency situations. Swimming while wearing a lifejacket is also impracticable, mainly due to weather conditions, sharks, hypothermia, and other potentially dangerous to swim in the sea is dangerous. Keeping afloat without a lifejacket may leads to drowning, so it is impracticable similarly. Boarding a survival craft from the ship and water while wearing a lifejacket is practicable when on board the boat possibly, but not from the sea is neither practical nor safe embarkation. Taking initial actions on boarding survival craft to enhance chance of survival and streaming a drogue or sea-anchor is partly practicable when using Lifeboat but not for Life raft. Operating survival craft equipment is also partly practicable when using Lifeboat but not for inflatable life raft, and smoke signals for emergency use only. These actions taken on identifying muster signals should be appropriate to the indicated

emergency and complies with established procedures, and initial actions after leaving the ship and procedures and actions in water minimize threats to survival. The timing and sequence of individual actions are appropriate to the prevailing circumstance and conditions and minimize potential dangers and threats to survival. Method of boarding survival craft must be appropriate and avoids dangers to other survivors.

3.2 Training cannot be conducted on board in fire prevention and fire fighting

In the part of fight and extinguish fires, there are some impracticable items as following. Using various types of portable fire extinguishers is impracticable for training on board. These actions are impracticable as following: extinguishing smaller fires, e.g., electrical fires, oil fires, propane fires, extinguishing extensive fires with water or using jet and spray nozzles, and extinguishing fires with foam, powder or any other suitable chemical agent; because ignition onboard is insecurity, especially in the oil tankers and ships carrying dangerous goods. Injecting high-expansion foam in compartment onboard is not feasible, especially for machinery and equipment installed in compartments, so entering and passing through, with lifeline but without breathing apparatus, a compartment into which high-expansion foam has been injected is impracticable. Because ignition in a particular compartment and make it full of smoke is unsafe, fighting fire in smoke-filled enclosed spaces wearing self-contained breathing apparatus is also impracticable. Producing an accommodation room or simulated engine-room with fire and heavy smoke is impossible and dangerous, thus extinguishing fire with water fog or any other suitable fire-fighting agent in an accommodation room or simulated engine-room like that. Extinguishing oil fire with fog applicator and spray nozzles, dry chemical powder or foam applicators is similarly impracticable, because manufacture of such oil fires on board is dangerous. Developing a rescue in a smoke-filled space wearing breathing apparatus is practicable with reservation assuming approval of the smoke production unit is available on board. Clothing and equipment supplied to crew are appropriate to the nature of the fire-fighting operations and breathing apparatus procedures and techniques should comply with accepted practices and procedures. The timing and sequence of individual actions should be appropriate to the prevailing circumstances and conditions, and using appropriate procedures, techniques and fire-fighting agents to achieve extinguishment of fire.

3.3 Training cannot be conducted on board in survival craft and rescue boats

When taking charge of a survival craft or rescue boat during and after launch, there are some troubles as following. Righting an inverted life raft while wearing a lifejacket is impracticable, just life raft is usually packaged placed on the ship and only be used in emergency situations. When the weather conditions and/or port regulations permitted, these

program as following are practicable: 1) giving correct commands for launching and boarding survival craft, clearing the ship and handling and disembarking persons from survival craft, and 2) preparing and safely launching survival craft and clear the ship's side quickly and operate off-load and on-load release devices, and 3) recovering safely survival craft and rescue boats, including the proper resetting of both off-load and on-load release devices, using inflatable life raft and open or enclosed lifeboat with inboard engine or approved simulator training, where appropriate. During management survivors and survival craft after abandoning ship, using and choice of communication and signaling apparatus is appropriate to prevailing circumstances and conditions. Rowing and steering a boat and steer by compass when the weather conditions and/or port regulations permitted. Using individual items of equipment of survival craft except smoke signals is practicable. But in the methods for demonstrating competence of use locating devices, including communication and signaling apparatus and pyrotechnics, using signaling equipment, including pyrotechnics is impracticable, because using smoke signals in the sea is limited to the actual use of the emergency. Preparation, boarding and launching of survival craft are within equipment limitations and enable survival craft to clear the ship safely. Ensuring initial actions on leaving the ship minimize threat to survival. Recovery of survival craft and rescue boats is within equipment limitations and equipment should be operated in accordance with manufacturers' instructions for release and resetting.

3.4 Training cannot be conducted on board in fast rescue boats

When take charge of a fast rescue boat after launching, if these items be implemented as following, will endanger the safety of the crew: 1) righting a capsized fast rescue boat, and 2) swimming in special equipment, and 3) recovering a casualty from the water and transfer a casualty to a rescue helicopter or to a ship or to a place of safety. Ships could carry out search patterns, taking account of environmental factors when the weather conditions and/or port regulations permitted at first.

3.5 Training cannot be conducted on board in advanced fire fighting

In the competence of control fire-fighting operations aboard ships, crews should understand and proficiency in fire fighting involving dangerous goods and using water for fire extinguishing, the effect on ship stability, precautions and corrective procedures. But for safety considerations, the method for competence which is practical exercises and instruction conducted under approved and truly realistic training conditions (e.g., simulated shipboard conditions) and, whenever possible and practicable, in darkness can not be carried on board. Besides, for security and practical reasons, some of the equipment/systems (such as fixed fire extinguishing systems) use is restricted to actual emergencies. In the competence of

inspecting and servicing fire-detection and fire-extinguishing systems and equipment, crews should understanding and proficiency in fire-detection systems; fixed fire-extinguishing systems; portable and mobile fire-extinguishing equipment, including appliances, pumps and rescue, salvage, life-support, personal protective and communication equipment. But the methods for competence such as practical exercises, using approved equipment and systems in a realistic training environment is impracticable.

4. Impact and Performance

The list may have some impact on maritime education and training institutions such as Training cannot be conducted on board need transferred to land, then added training content and advance the knowledge and skills update training for relevant maritime educator. In consideration of basic safety training conducted ashore in this revision, training institutions require to add facilities and equipment to cope with the increased basic safety skills update training in future. For example, the amendment added tankers advanced fire fighting programs and proposed new requirements on equipment of training institutions. In view of the list impact the training workload of maritime education and training institutions, the next step is how to implement the training programs involved in the list for maritime education and training institutions ashore. Recommendations for performance work of education and training institutions: carrying out the translation of Convention text and related documents; research the affect of comprehensive reviewed and revised STCW Convention and Code, including evaluation for the performance ability, and publicizing and discussing before performance; adjust domestic regulations and maritime education in the professional maritime institutions. On the basis of the above approach, consider designing a comprehensive and systemic program to maintain competence, which involved "training cannot be conducted on board", finally realize the performance targets.

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A Maritime College Case Study of Cultural Engagement

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Abstract

Educating people about cultural differences is best done through a direct process of engagement. This paper presents a case study of such engagement in the Master of Science degree program in International Transportation Management (ITM) at the State University of New York (SUNY) Maritime College, Bronx, New York. It is viewed from the dual perspectives of professor and student.

About 37% of all students in the ITM program are from outside the United States. Of this group, the largest contingent over the past few years have been from Turkey. Turkish students come to the ITM program from several avenues, including graduates from an undergraduate dual diploma program that SUNY Maritime College has with Istanbul Technical University, referrals from Turkish alumni of the ITM program, referrals from employers in the maritime industry, and those who become aware, through the Internet or other means, of the ITM program offerings.

The student subject of this case study, Ezgi Uzel, got her bachelor's degree from Istanbul University, School of Transportation and Logistics in 2004. Since there was no master`s program in any of those subjects in Turkey at that time, she chose to come to the U.S to search for a master's program, and discovered the ITM program from its website. She started to study for her MS in January 2005. Ezgi got her master's degree in 2007, following which she has been teaching at SUNY Maritime College.

This paper examines Ezgi's career path from student to lecturer, and now a PhD student, who studied in a foreign country and immersed herself in experiencing cultural differences so as to exploit her global opportunities.

1. Introduction

Educating people about cultural differences is best done through a direct process of engagement. This paper presents a case study of such engagement in the Master of Science degree program in International Transportation Management (ITM) at the State University of New York (SUNY) Maritime College, Bronx, New York. It is viewed from the dual perspectives of professor and student.

About 37% of all students in the ITM program are from outside the United States. Of this group, the largest contingent over the past few years have been from Turkey. Turkish students come to the ITM program from several sources, including graduates from an undergraduate dual diploma program that SUNY Maritime College has with Istanbul Technical University, referrals from Turkish alumni of the ITM program, referrals from employers in the maritime industry, and those who become aware, through the Internet or other means, of the ITM program offerings.

Aside from the dual diploma program, the ways in which Turkish students come to SUNY Maritime are not significantly different than how students from other countries learn of the ITM program and choose to apply to it.

The student subject of this case study, Ezgi Uzel, got her bachelor's degree from Istanbul University, School of Transportation and Logistics in 2004. Because there was no master's program in any of those subjects in Turkey at that time, she chose to come to the U.S to search for a master's program, and learned about the SUNY ITM program from its website. After being admitted to the ITM program at SUNY, she started to matriculate in January 2005. Ultimately, Ezgi got her Master of Science degree in 2007, and since then she has been teaching as an adjunct in the Global Business and Transportation department at SUNY Maritime College. She taught in traditional classroom mode until the end of spring semester 2008 when she returned to Turkey and continued as an adjunct faculty member for Maritime College by teaching several online classes.In September 2008, Ezgi began attending Yeditepe University in Istanbul as a PhD student within the Institute of Social Sciences in the program for Business Administration, Marketing track.

Ezgi says "I always believe in working in the kitchen first before becoming the server of the food." During her school years, her experiences in different companies helped her to gain practical workplace skills and knowledge, helping motivate her to continue on to something more challenging once she got her BS degree.

2. Internships

She had internships in different departments of different companies for the purpose of getting a general idea about how things are handled in different segments of business. Her first internship company was EXEL Global Logistics Company which was acquired by Deutsche Post World Net in 2005. She trained through its air import / export operations departments in its Istanbul office in 2001. During this period with EXEL, she had the chance to observe air import / export operations for the first time. The experience was quite beneficial since it was one of the biggest 3PL service companies in the world.

Her second experience was MNG Airlines in 2002, which is the first private airline company in Turkey. It has a fleet of 28 freighters and operates both domestically and internationally. She trained within its operations and trade departments and learned how sales procedures take place in an airline company, how the cargoes are accepted for carriage and how a freighter is dispatched.

The broadening of Ezgi's industry experience and knowledge continued when she was in the third year of her undergraduate career at Istanbul University, and the school management announced that some Turkish logistics companies were looking for students to participate in summer internships. In Turkey, this kind of industry access was possible only by using an exchange student program called Association Internationale des Etudiants en Sciences Commerciales et Economiques (AIESEC). The program was based on matching the students with appropriate companies. Ezgi applied for it and matched with ELMAS Spedition and HANDEL, GmbH, one of the Turkish companies located in Frankfurt. For three months, Ezgi worked as an export / import land transportation operations executive, since the most favorable transportation mode between Turkey and Europe is land transportation. She learned a lot about how to manage a fleet of trucks, and learned about regulations of EU and several countries that trucks had to pass through before they arrived in Turkey. She prepared all the necessary documents increasing her knowledge about multimodal transportation documentation.

Ezgi`s last internship before she got her BS degree was with FEDEX Istanbul, which was one of the biggest courier firms in the world. She worked as a customer agent, handling all import shipments that were having release problems with U.S. Customs. It was a very important internship for her, because it was the first time she became involved in American business, and learned the export/import system of the country.

3. The ITM Capstone Project

Once admitted to the ITM program, Ezgi's background facilitated a successful progression through its core and elective courses. The ITM program is designed to educate the shipping executives of the future; most students have no ambition towards a terminal degree. Their ambitions are industry focused. Ezgi Uzel was typical in that her career

goals were to gain a Master of Science degree and propel her to a successful business career. The turning point in Ezgi's career goals began when she elected to take the graduate Capstone course as the culmination of her graduate career.

The Journal of Commerce has said that for students in the ITM Capstone course at SUNY Maritime College, "anticipating and planning for every contingency is as challenging on paper as in real life." Webster (2010) The course is team-oriented; in today's commercial world, companies often put teams together around specific projects. The course is designed to emulate this industry practice. In industry situations, people are selected on the basis of expertise. In the Capstone class, students tender resumes and interact in a selection process that balances competition and cooperation; they cannot simply coalesce in a team with buddies with whom they feel comfortable.

Students are encouraged to coalesce around people with whom they feel comfortable, but who also encourage their intellectual and emotional senses. The team selection process challenges students to choose leaders that will help their teams weather the long haul of the Capstone class by exhibiting:

- Integrity
- Reliability
- Intellectual depth
- Physical and mental stamina and commitment

In the end, each student accords legitimacy to the team of which they are a member; before a team is validated by the professor, every student makes an affirmation, "yes, I want to be part of this team."

In the fall term of 2006, Ezgi Uzel participated in a team led by Kevin Carroll, a student who, until the Capstone course, had completed all of his classes online. Online was best suited to him because of his status as a lieutenant on active duty in the United States Coast Guard. His multinational team was required, as are all Capstone teams, to research a project set up by the professor. In fall 2006, the students were given a general scenario that they had to develop encompassing three major research topics.

Each Capstone team was to play the role of management consultants who have been hired by a major global trading house. The trading house was portrayed as hemorrhaging money because of lack of good business vision and inefficient, un-integrated supply chain operations. The job of the management consultants (the student teams) was to create a plan to optimize the supply chain operations of three projects that their global trading house client found particularly troublesome. Assuming the consultants succeeded in making a good plan and the client accepted it, further business could develop. Each team had to develop three optimized scenarios in which the students detailed the business environments and supply chain processes involved in those specific international commercial transactions, from sourced raw materials at their origins to delivery in final form:

1) Exporting unfinished hardwood lumber and logs, originating in different areas of the southern and northeastern United States, and transported in ocean shipping containers to Asian destinations;
2) Importing Light Emitting Diodes (LEDs) from China to a manufacturer in Austin, Texas of illuminated indicator panels and switches for portable electronic equipment, and then exporting the finished product to customers in both Jordan and Israel;
3) Export of apples from New York State to Canada, Taiwan, and Japan.
The students were told that good explanations of optimum supply chain processes must include:

- Understanding cultural, economic, legal and political contexts of the extended supply chains involved;
- Choosing the best way to create, ship and distribute these products
- Attending to all significant supply chain issues that might be derived from the scenario being developed, e.g. whether there might be a reverse logistics channel involved, whether demand can accurately be forecast, and how to resolve management issues of planning, organizing, and controlling, etc;
- Clear and concise narration that is well-documented with references and supporting materials

Lurking problems existed in each of the commodity scenarios that the students had to discover and explicate in order to optimize their grades.

The students were also told by Dr. Howard that they could not attain "A" grades without basing their projects on significant primary research.

Lieutenant Carroll's team, and each of the other teams, was charged to prepare a hardcopy report of approximately 60 pages, and to present in fifteen minutes a summary of the highlights. The presentation was done in front of a panel of experts, made up of Professor Howard, James Drogan who is a member of the SUNY Maritime graduate faculty and a former IBM lead management consultant, Don Frost who is the Publications Editor of the Connecticut Maritime Association, and Rajesh Joshi, a Lloyds List journalist. Following the short presentation, each team fielded questions from the panel for up to an hour and a half.

The ITM program offers two options for graduate students when they are finishing the degree. Students can choose either to write a thesis or to take the capstone course. Ezgi decided to take the capstone course for several reasons, but the most important reason was to learn more about how to work with a team whose members came from different cultures. Being Turkish, Ezgi symbolized both Middle Eastern and Europe culture together. Another student, Helen Sun, was Chinese and symbolized a Far East culture; the rest of the team were Americans who symbolized the Western world. Each member of the team had different business experiences in different parts of the world. This was the biggest advantage for the team, because the capstone project required global knowledge in logistics, and this could only be facilitated by having the kind of diversity that the team enjoyed.

Kevin Carroll persuaded the team to divide into subgroups consisting of one American student and one student from a different country. Each subgroup picked one of the scenarios as a main one, and started to work on it. Ezgi partnered with Kevin Carroll on optimizing that part of the project re "Importing Light Emitting Diodes (LEDs) from China to a manufacturer in Austin, Texas of illuminated indicator panels and switches for portable electronic equipment, and then exporting the finished product to customers in both Jordan and Israel".

Kevin and Ezgi divided their work into two parts: 1) exporting the raw materials from China to the US; 2) importing the final products to Israel. Ezgi's intern experiences in export/import operations and Kevin's experiences in marine transport and port issues within the US facilitated their research. The two students found that the most difficult areas of their research to tackle were the differing export/import laws and procedures of the countries involved; also, they encountered different business cultures, and some language problems during the interviews done to satisfy the capstone requirement that a significant amount of the project be developed around primary research.

Ezgi and Kevin did not disagree with each other during this time, except on whether to use Mexican maquiladoras in producing some parts of the finished product so as to enjoy the benefits of the North American Free Trade Agreement (NAFTA). Kevin and Ezgi engaged in some discussions about ethics and did a lot of critiques about the effects on labor, environment, and safety resulting from using the Mexican maquiladoras before they came to an agreement to do it. Their interaction stood them in good stead because the issues that they discussed were ultimately posed to them by the capstone panel of experts. The question about the ethics of using maquiladoras was for them a very difficult one to answer since the ethics that they evaluated varied from one person to another and one culture to another.

After each of the team's subgroups completed their own parts, all team members came together to share their ideas about all scenarios and put the project together. Most of the cultural challenges were seen in export/import issues with Asian countries. Also, every country considered the safety and security issues in a different way. The team determined in its evaluation that in logistics businesses, the most problematic issues were about risk taking and responsibility sharing.

The team members emphasized that all of the three scenarios were related by demand and supply management of the materials and products that were going to be exported and imported. Each commodity was perceived and handled differently in every country through which the supply chain extended and the products moved. So, the team included in its presentation the concept that logistics is a very cross-cultural and interdisciplinary subject, closely related with economics and marketing sciences. Although globally, every country agreed on common technical requirements of logistics, there were still problems that occurred caused by cultural issues. The team referenced the study of Hofstede (2001), to work through and take account of the cultural differences between countries in terms of the thinking and

social actions of businesspeople and government people. For example, according to the Hofstede model, power distance is high in China, which makes the logistics processes take more time and also makes them more complicated. The team members interviewed a Turkish forwarder experienced in Chinese business who explained that business arrangements with his Chinese partners often took "too long." Another Hofstede dimension, uncertainty avoidance, is generally low for Israel, where people prefer to work on trust rather than on written agreements. Also, they are less calculated in taking risks, and they show more tolerance of rule-breaking. The team used these general cultural characteristics as a basis for evaluating the Israeli part of the scenario.

During the whole work of researching and developing the capstone project, team members were able to maintain a respect and empathy with each other; no negative situations happened. Instead, within the team differences between cultures created a synergy that helped the team led by Kevin Carroll to became the most successful one.

4. Teaching

In Dr. Howard's estimation, Kevin Carroll's team was the best of the fall 2006 teams, and Ezgi Uzel had shown the "right stuff" to be something more than a student with industry career goals. From Dr. Howard's perspective, higher education should be part of the ongoing quest to add to the store of human knowledge; it is not a matter of only preparing students for a career, important as that task may be. The spin-off of adding to the store of knowledge is what can loosely be termed, "progress." One example is the U.S. original space program, without which the advances that we have seen today in communications and computer technology may not have occurred with the speed and innovation that have characterized them.

To the extent that we don't participate in an ongoing quest for knowledge we play a circle game that gets us back to square one after expending resources.

At a dinner sponsored by the Turkish Student Association the following semester, Dr. Howard suggested to Ezgi Uzel that she consider teaching. He did not realize how fortuitous his offer was to her at the time, because an academic career had become Ezgi`s plan for the future. She was "very happy" to catch this opportunity so early in her life. After graduation ceremonies, Ezgi asked Dr. Howard: "do you know how old I am?"

Later, she explained her excitement at teaching for the first time by saying, "Those days were dream days for me since finally I found the chance to teach what I had learned during my logistics work and in school. I was only 25 years old and I had already taken the first step of my academic career by getting this opportunity".

In fact, after Ezgi was approved for the job of being an adjunct instructor in the Global Business and Transportation Department at Maritime College, her concerns began to rise about being so young and inexperienced in teaching; Dr. Howard told her that "everybody

starts somewhere, sometime," but Ezgi was also concerned about being a foreigner, and of course speaking English as a second language. Instead of worrying about all of these perceived problems, Ezgi met the challenge head on by improving her English and learning more about how to speak in public by enrolling in the Communication Skills Certificate program at New York University.

Ezgi was working in a freight forwarding company as an inside sales consultant when Dr. Howard offered her the opportunity to teach at SUNY Maritime College. After she began to teach an undergraduate Export/Import course in the fall 2007 term, she decided to quit her job in the company. Her decision was a risky choice, since she was making a lot more money as a freight forwarder than the money she made by teaching. But by the time she made the decision, teaching and being a professional academician was increasingly her major career goal, and she took the decision as a career life style instead of a mere job decision, which she would have made, as she put it, "only for earning money."

The first month of Ezgi`s teaching adventure was not easy. Ezgi was Turkish, spoke and wrote English as a second language, and compared to most of her students, came from a different part of the world with different cultural and business perspectives. Ezgi`s job experience was mostly based on European businesses and there were many differences in export/import issues between the US and Europe. All of these factors stood in context of her having to teach at least 45 students who were mostly American, male and of ages very close to her own, most of who had no knowledge about export/import management. But Ezgi believed in herself, and took advantage of the opportunity to give the students instruction on the subject from a very global perspective, consisting of both European, and the US perspectives. Students became aware of this advantage of having Ezgi as a teacher, and appreciated being given case studies about their subject from other parts of the world. Only a few, male, Turkish students in the school reacted negatively to Ezgi as a teacher because she was a woman and, in their opinion, too young to be in that position. The irony was that Ezgi had more industry experience and learning than her detractors and she had traveled thousands of miles to face a cultural bias based on gender from her own countrymen.

But Ezgi persevered, increasingly taking advantage every way that she could of being in the US, using her experience and learning, and teaching (mostly) to Americans who in general appreciated the benefits of diversity and academic freedom; it was her experience that the general American culture motivated foreigners to feel like they were "at home." Also, despite the few Turkish male detractors, the large and socially active Turkish population in New York was another reason that Ezgi felt "at home." For example, it was at a dinner sponsored by the Turkish Student Association that Dr. Howard had offered her the chance to teach for the first time.

After she survived the challenge of her first month, Ezgi started to enjoy her new job and became convinced that she had chosen the best thing for her career. Before she came to the

U.S., her dream to advance her learning had almost dissolved around the fact that there was no master level program in Turkey focused on international transportation management.

Aware that she was fortunate, and that few Turkish female students with her interests were so fortunate, she determined that she would try to bring back to Turkey the benefits of all of the knowledge that she had acquired in Europe and the U.S.

5. Coming Full Circle

On this basis, Ezgi decided to pursue a PhD in Turkey. She went back to Turkey in June 2008 and started her PhD at Yeditepe University on the marketing track within the Business Administration department. During the time she pursues her doctorate, she is working as a research assistant at the Faculty of Commerce in the International Business and Trade Department. She continues teaching online courses for SUNY Maritime College, and that keeps her connected with students from all over the world. In June 2010, Ezgi was also one of the Turkish hosts who guided and taught a study tour of undergraduate students in the International Transportation and Trade (ITT) program at SUNY Maritime College. The study tour, led by Dr. Bob Edmonds, Vice Chair of the Global Business and Transportation Department, brought ITT students to international businesses and academic forums on trade and commerce in Greece, Turkey, Romania, and Poland.

Ezgi had come full circle from her beginnings, directly engaging American students in Istanbul, showing them the benefits of everything that she had learned and experienced. She told them: "The world is a very big place, but humans have the power to make it intimately small, or at least bring people very close to each other, no matter from where we come or what language we speak; I know, because I did it, and I believe that anybody else can as well."

In that message to the ITT students on study tour in Istanbul, Ezgi illustrated that educating people about cultural differences is best done through a direct process of engagement. Part of the engagement that Ezgi experienced was as a result of her own efforts; another part was deliberately thrust upon her, i.e. the carefully constructed Master of Science degree program in International Transportation Management at SUNY Maritime College, the Capstone class, and her selection as an adjunct instructor for the Global Business and Transportation Department.

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The Feasibility of Instructional Assistant System in Maritime Universities under the Semi-Military Management

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Abstract

Semi-military management has been adopted in Chinese maritime universities for nearly half a century and it has been playing an important part in the cultivation of high qualified shipping talents. But with the development of the society, the cultivation of shipping personnel also needs reforms. This paper aims at how to help the high school graduates adapt to the college life quickly and analyses the necessity of assigning instructional assistant under the new situation of the society. The author summarizes the special characters of students of maritime majors and discusses the feasibility of instructional assistant system. At the end, the author takes his own experience of being an instructional assistant as an example to prove the feasibility of the mechanism and recommend to spread it to other maritime universities as an supplement to the semi-military management.

Key words: maritime universities; semi-military management; instructional assistant

1. Introduction

It has been nearly half a century for maritime universities to implement semi-military management since three maritime majors in Dalian Maritime University (DMU) adopted semi-military management under the State Council's permission. Semi-military management system has been playing an important part in enhancing the students' feeling of collectivity glory, responsibility and sense of responsibility.

However, semi-military management has some deficiencies and disadvantages. The content of semi-military management needs to change in order to adjust to the development of society. Most of the maritime major undergraduates, especially the freshmen, are born in late 1980s, even early1990s. The freshmen have some different characters from the students before and they are confronted with a new environment that is totally different from that of high schools. During their transition from high school students to undergraduate students, they will encounter many difficulties and confusions, so it becomes very urgent to guide them to adapt to the college life and establish healthy living habits and correct Weltanschauung.

2. The necessity of outfitting instructional assistants

2.1 The current situation of the society

2.1.1 The examination-oriented education system in high schools

In high schools, the education the students have received are examination-oriented, which is the most common reason leading to the freshmen's confusion during their character transitions from high school students to college students. Under the atmosphere of that education system, the society, schools, families and the students themselves, set the college entrance examination as the only goal of the students' school life and study becomes the main tune of their lives which edges out the time of joining other activities. As a result, most of the freshmen are good in academic study but bad in practical operation. So they need to be guided to the colorful college life as soon as possible.

2.1.2 The strike of information society

In current society, all kinds of information come in a rush with great amount and change rapidly, which make the freshmen find it difficult to distinguish the good information from the bad one. Some students may have the ability to distinguish the right from wrong but cannot make the right decision, which may lead them to the wrong direction of their life.

2.1.3 The infection of upperclassmen

As a new comer, the freshmen have no friend in the university, so how to spend their spare time becomes very import. Just relieved the burden of college entrance examination, the freshmen are eager to relax and have a rest. But it is very easy for the students who do not have any hobby to do something that is harmful to their college life, most common of which is going to the net bar and becoming addicted to it. Some of them may feel regret but they can not stop repeating the mistake, when they need a person to help them.

2.1.4 Heavy financial pressure

As the prices of living items and education fees increase year by year, some students from poor families feel it a heavy burden for their families to support them, which makes them a little depressed and dare not to contact others. And it makes the process of adjusting to the college life longer and affect their study in the end.

2.2 The fact of the university

DMU establish the outfit scheme of supervisors according to the fact of the maritime major students. In DMU, a supervisor takes in charge of 120 students in average. In other words, a supervisor administers about 6 classes. As we can see, it is obvious that the number of supervisor is far less than that of students and the supervisor can not take care of everyone in his lochus. Some minor problems may not be solved timely, which might deteriorate to very severe ones.

2.3 The speciality of maritime major students

After analyzing the students of maritime majors, several special characters of them are concluded as follows:

2.3.1 The severely maladjusted sex ratio

Because of the tough working condition of navigation, female can not fit the job as their male counterparts. So the female students are not recruited for the maritime majors in most maritime universities (Shanghai Maritime University recruits very few female students in these majors). As a result, all the students in these majors are male, which is not good for the students' mental development. Because the students seldom contact female students, they don't know how to talk with girls and develop relationship with them. And some of them may suffer mental problems because of this, which may lead to some unexpected problems.

2.3.2 The imbalance of urban-rural ratio

According to an incomplete statistic, the urban-rural ratio of the college students the nationwide is nearly 50%, and the number of key universities is even smaller, just 30%. But the urban-rural ratio of our university's maritime major students is much larger than that of other majors and universities. Take the Lochus 2007 of navigation major in navigation college, DMU as an example, the number of recruited students in 2007 is 611, 63.8% of which are from rural areas, about 386 persons. The difference of student backgrounds results in different management methods as the rural students have some special characters that are bad for them to adapt to the college life quickly. These special characters are listed as follows:

(1) Withdrawn and not good at affiliating with others;

(2) Have strong curiosity as they did not know much about the urban life;

(3) Poor study foundation because of the imbalance of high school education resources nationwide;

(4) Poor family financial conditions

2.3.3 The great number of students attending the college entrance examination twice

Take the Lochus 2007 of navigation major as an example again, according to a survey, the number of the students in the lochus who have attended the college entrance examination twice or more is 341, accounting for 55.8% of the total number of students in the lochus. As those students spent at least 2 years to take the college entrance examination, most of them are 2 or 3 years old than other students, which may be an obstacle for them to communicate with each other.

2.3.4 The swift change of students' character and personality

Nearly all of the students enrolled in 2010 are born after 1990 and those students have some typical characters different from those enrolled before.

(1) Have strong curiosity and can accept new items quickly;
(2) Confident but weak in mind, sensitive and selfish to some extent;
(3) Have some odd hobbies that can not be understood by adults;
(4) Have strong consuming concept, but more realistic;
(5) Have bright personality, lack of loyalty to the team;
(6) Receive lots of information but feel empty in the inner mind.

3. The feasibility of instructional assistant system

Though DMU has a great number of professional supervisors, it is still very necessary to implement the instructional assistant system and DMU has some qualifications that make the system feasible.

3.1 Semi-military management

Semi-military management system has been adopted in DMU for nearly half a century and the university has established its own effective student management method. So it becomes easier for the instructional assistants to carry out their work. By the way, the students have stronger consciousness of obedience than those of other majors and they are more likely to accept the instructional assistant's gudie.

3.2 Academic authority of being an postgraduate

The instructional assistants in DMU are selected from excellent postgraduate students and most of them are 4 or 5 years older than the freshmen, which is easy for them to communicate. As the age gap is minor, the instructional assistants are regarded as big brothers to the freshmen. The students will more likely to tell their private affairs to the instructional assistant, which they will never tell to their parents or teachers anyway. What's more, being a

postgraduate student is a dream for some of the freshmen and they respect postgraduate students from the bottom of their heart, which is useful for the instructional assistants to teach and give advice.

3.3 Advantages of being the same major

One requirement for being an instructional assistant is that he must be a postgraduate studying the same major in the key universities when he was the undergraduate student. So there will be no obstacles for the instructional assistants to supervise the freshmen' study and give some useful advice to them on how to study and which subject should be paid more attention. The students can get advice after class and it becomes a very good way to make up the teachers' lectures in class and make the effect of class-teaching maximum. In other words, the supervisors take in charge of the students' affairs in every aspect, however, the instructional assistants emphasize on study.

3.4 Other advantages

Generally speaking, the postgraduate students have more spare time than that of undergraduate students, which allows them to spare enough time and energy to supervise the freshmen. And at the same time, it is a good opportunity for them to enhance their ability and the art of intercommunication, which is vital in their future job. Besides, the salary, though not very much, can relieve their living pressures, which means that they can ask less or no money from their parents. And if the university hires more professional supervisors in order to achieve better management effect, the expenses will rise dramatically. But the cost of hiring postgraduate students to be the instructional assistants is much less. And the university can supervise the undergraduate students and postgraduates through this mechanism. So it is a win-win mechanism for both the university and the students.

4. Implementation of instructional assistant system

The first year is the most important year for the freshmen to transit from high school student to college student. How long it will take for the freshmen to adjust to the college life depends on how the instructional assistant mechanism is carried out and how effective it is. The following principles should be followed when implementing the mechanism.

4.1 The selection of the instructional assistant

The selection process of the instructional assistant should be strict and the candidate should be fully qualified, for example, he should be a Party member, should be a postgraduate

whose undergraduate major is maritime related majors and the scores of professional courses should be at least 80 in average. And the candidate should be open-minded and good at communicating with students. Last but not least, they should love the job and eager to do the job.

4.2 The monitoring and assessing mechanism

The university should establish special department managing the affairs of the instructional assistant, which include the monitoring and assessment in a fixed period. The department should assign a person to do the monitoring work during the whole semester. And every semester the university should organize several assessments on the assistants' work and educe the evaluation of each instructional assistant. At the end of the term, the instructional assistant who gets the highest score in the assessment should be given prize.

4.3 The financing of instructional assistant system

The university should found special fund for the operation of the system. With the back of abundant fund, the mechanism can work smoothly and achieve the best result. The fund should include the assistants' salary, the prize to the best assistant and the best class, and the money used to organize activities for the freshmen to help them adapt to the university life quickly.

4.4 The training of the instructional assistant

Once the instructional assistants are selected, they should attend some training on psychology, management, communication skills and so on. After the training, the instructional assistant should have the basic ability to deal with student affairs. And during the semester, several training related to student management should be organized aperiodicly.

5. The experiment of instructional assistant system

In 2008, DMU tried to apply that method to improve the management of undergraduate students and I was the postgraduate student then. After two round of selection, I was chosen as the instructional assistant supervising class 8. The details of the students in class 8 can be seen in the table below.

Tab1. The details of the students in class 8

Items	Statistics
Age structure	Born in late1980s: 22; born in early 1990s: 6
Student classification	this year's graduates:13;others:15
Family structure	singleton: 5; others: 23
Finance situation	Poor: 20; medium: 2; affluent：6
Urban rural ratio	Rural/urban: 20/8

In the first semester, I try my best to do the job. I encouraged them to set their goals and taught them to study regularly. I taught them to lower their expectations and evaluate their ability appropriately and learn to study from others. I usually went to the students' dormitories and help them solve some problems in any aspect.

After a term's effort, we were happy to the results of the attempt. The students in class 8 adapted to the college life much quicker than other students and most of them are energetic to join the college life and other activities. None of them suffered homesickness or other emotional problems. What is better is that none of them failed in any subject and got high scores in the final examinations. Compared with the students enrolled in 2007 in the corresponding period, the rate of pass increased by 60%, which was a great growth in our university.

6. Conclusions and recommendations

Chinese maritime education and training institutions need to improve their quality of education. Though the instructional assistant system is just a try in the reform of student management, it got a satisfactory result. And I think it can be spread to more maritime universities as an supplement to the semi-military management if the conditions of those universities permitted. But at the same time, some factors should be considered when carrying out the mechanism such as the changes of regulations, society and technology.

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New Frontier for Global Seafarers

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Abstract

1. The history of the photograph exhibition

1.1 The beginning of the photograph exhibition

Plaza Agreement accelerated a rapid strong yen for 1985 years. As a result, Japanese seafarers lost international competitive power all of a sudden due to the strong yen and Japanese merchant marine industries pushed a large-scale Japanese seafarer reduction plan
We 'Hato-Kai have been encouraging the colleagues of seafarers who were really facing at the crisis of the unemployment and in his discouragement even now. Under such circumstances, in 1987, the 1st "Beyond the Horizon" photograph exhibition was held at Yokohama, Japan.

The utmost characteristics of this photograph exhibition "Beyond the Horizon" are as follows,

1) All works displayed in this exhibition are taken by the seafarers in their interval of the voyage at each place in the world.
2) The seafarer himself acts both as a photographer and as a presider of the Exhibition.
3) It gets the evaluation of "The most unique photo exhibition in the world." This photograph exhibition has also been continued for 23 years.

1.2 To the jump to the overseas exhibition and / to the IMO

When the 2nd photograph exhibition at Yokohama, which was held in 1988, there was a proposal of "Let's circulate this photographs to the world" guided by SGI *-1) president *-3).
In 1994, we could hold first overseas photograph exhibition in Far Eastern University at Vladivostok, Russia as the fruits of the friendship between the Russian young men of Far Eastern University and members of the Hato-Kai.
To start with the overseas Exhibition in Russia, we held it next by next after that such as Philippine, China, Viet Nam, Malaysia, Norway, Mongolia, India, Indonesia, UK, and Ghana. They are 11 countries, 24 venues all in all.

In June 2008, we held a photograph exhibition under the joint auspices of IMO. Now, our photographs are displayed in IMO headquarters as a long standing exhibition.

1.3 From one mile photograph exhibition, to the study on the environmental issues

In 1991, we, Hato-Kai, started the small-scale photograph exhibition activities called "one mile photograph exhibition" One after another, member of Hato-Kai has become the host of this small-scale photograph exhibition at the educational facilities of his own residential areas, the schools, the hospitals and the public facilities in the venues of 900 or more. Then, through the relationship with many people by adjusting negotiation, project, management, and public relations etc., Hato-kai members learned a lot and could grow up as humanly.

We keep a description of impressions corner in the exhibition halls with the aim of the improvement of the photograph exhibition every time.
1) There is impression in each photograph, and I felt the peace with the children's smile. I was deeply impressed since a wonderful photograph can be taken during their hard working.
2) I could enjoy the sceneries from the world, and be impressed that the countries in all over world being connected each others. The earth is showing various faces and supports our lives in this moment as well when we live here unconsciously. How the wonderful earth! I pray the health of people and the earth too.

In addition to this, in June 2008, after holding with IMO, through this "one mile photo exhibition", Hato-kai began not only to diffuse the marine affairs idea but also grapple with the environmental issue on the earth. After holding the Exhibition in IMO in June 2008,

Hato-kai still keeps appealing the importance of marine affairs idea through "One-mile Photo Exhibition, and also it began to grapple with the environmental issues as global concerns.

2. New frontier of global seafarers

I would like to introduce the voice exchanged on the tanker ship recently.

One day, the European chief engineer on a return-trip of Very Large Crude Oil Carrier (VLCC) from Japan to the Persian Gulf told the Japanese master who was a colleagues and a member of Hato-kai.As you well know, even if VLCC has arrived at a port, no one can get ashore and the life on VLCC is certainly constipated.The European chief engineer asked "Has the captain ever boxed in the prison?"Of course, the captain shook his head at the side.The chief engineer said "Look at here! How the life is going on this ship. Even if I am in prison, I can watch television. I can probably be permitted either talking to the family by the telephone for about ten minutes or exchanging an e-mail in a week. But, we can't get ashore, even if I have sent an e-mail to my family, it should be touching on captain's eye, of course, even if I would like to watch television, but there is no signal on the ocean"

The captain could understand and nod soon, and then told the chief engineer "I could find out your intention very well. At once, I will call up the company and ask him to arrange your prison" What I would like to say now is not mere joking; that there is nothing changeable in his surrounding even if he has gotten off the ship, unless he could not change his own mind and values in future.

2.1 Creation of new values

The global economic crisis beginning in 2008 has impacted the shipping market too. There is a concern that one of its impacts will be a slowing or scaling back of Bulk Carrier and Oil Tanker businesses. But the sudden decrease of Car Carrier and Container shipping business are still anticipated, in addition to this, there is a concern the pessimistic opinion like "The global shipping business will never come back to the former prosperous conditions again"

As for these situations mentioned above, at first glance, it seems to be the opposite position like the tumult which we were exciting and be on the spree at the prosperity before 2008. However, the actual facts, both pessimism and tumult, are the same face showing right and left occasionally, as well as both side of coin. In other words, both the prosperous conditions and the depression are only the phenomenon by the one side of judgment decided by the economy. Originally, human being, if I say more, it is more important to care for about the seaman working in the global society in the first place, on the contrary, in the modern society, we have to give away the top priority to the economic activities.

Because of these reasons, the most important fundamental value has been lost like either what is the value for the human being to work for or why we must be diligent for.
As mentioned above Chapter 1, while the Japanese shipping business reached the record-breaking crisis, this photograph exhibition started.
At that time, we had to think about what we could do something for the colleagues who had to leave from the ship and who were forced to goes somewhere else. Under these confrontations with the difficult situation in which no one could breathe, we always ask to ourselves seriously what we had to do, and then, our photograph exhibition has been founded. In other words, through the activities of displaying the photographs, we had to think how we can create the new value of the ship and sea, and how I can contribute to the society where I am living in now.

2.2 The creation of value

As for SOKA, which is the name of our religious organization, means" the creation of the value "in Japanese characters. SOKA, the creation of the value is a sort of antonym against the pessimistic opinion or also locating in the opposite side of the tumult that everybody was enjoying on the spree in the prosperity before 2008,
We all respect the founder of Soka University, SGI president Dr. Daisaku Ikeda*-3) proposed the need of "Human revolution"

It is the revolution of the value engaging that, once a personal could convert his own fate, then that conversion of personal will lead "mankind's" fate conversion. However, the facts of life are passing day by day. The history which seems to be the huge swell can not be easily changed by human being. It looks like it would be impossible. However, the time flowing is the consecution of a flash moment. The most important thing is a flash moment. That is to say, "Here Now" where we just exist, is the most important and brings the real mean to human life.

Just then, IMO decided this year as "the year of the seaman"
Considering this protocol, the merchant maritime organization of each country is promoting the public relations of seafarers to young people. To say nothing of it, much more important factor is whether the young people who chose seafarer as his career can willingly work on board and enjoy his seafarer's life as long as possible. In other words, the most desirable future example for seafarer is a capable person who can find the value of life and enjoy of its life in any situation as a seafarer by himself, not a person who is controlled by the environment of a ship. Working on board never equals to live in the prison. In that sense, value creation brings the meaning to their lives.

2.3 The fount of creation

Seaman's issue from Hato-kai point of view, we try not to stand on the third party by

saying" how the future of the seaman would be possible to change under such global society? ", but we value our consideration for "what we can do for other seaman just bothering the situation being put?" and also, "what we can do for the people who hesitates to become a seaman?" Further more, Hato-kai member try to maintain the positive posture, like how we should act best at the right place where we are standing on now?

We think that the seaman's issue is the subject to be concerned actively by seaman-self. SGI President Dr. Daisaku Ikeda*-3) urged, instead, a contributive way of life as described by the Buddhist maxim that when we light a lantern for others, our own way forward is also lit. The source of illumination needed to dispel the chaos and darkness is to be found in actions that bring forth our own inner light through committed action for the sake of others.

Originally, people truly makes as if to live a human being, therefore, the premise which no one can avoid is "others'" existence. We, Hato-Kai, have carried out this photo exhibition as the volunteers for 23 years with imagining "others", who are like the colleagues to have being left from the merchant marine industries and the people not to know the value of the sea and the beauty yet. In other words, we, Hato-Kai, learned to know "others'" existence for the first time, through these activates, then, we could well understand "Ship is our place to live"

2.4 New era of value change

We learned to love the ship and the sea more through the closer relationship to the existence of "others". However, it may not be easy to change each individual sense of value even though each seaman desires to overcome such discontented reality.

IMO decided 2010 as "the Year of the Seaman", showed the data that the global shipping business will increase up to 2.5 times more in 2050, so that 27,000 of the seamen would be needed every year. (Router News, Kaiun Suisan News, Feb.24, 2010) Considering the reality like this information, and also despite of the rapid decrease in number of seamen now, we need to increase seamen in number as what IMO predicted. At the same time,

The desirable seamen can think "Here Now", at the place they are standing on, who try to work hard and train themselves with the best efforts on board.

The contribution to "others" will build the new value to love the sea and the life on board. We found these theories during 23 years of activities of photograph exhibition in all over the world as volunteers. In view of the above conditions, I would like to raise these three steps here.

The first step : "Present condition"

The volunteer activities by the seamen shall be promoted.

- To promote the volunteer activities, let the people off- shore know about the ships and the life on board , which are carried out by the seamen, or the student aiming to be seaman, or the teacher in the marine affairs educational facilities.

・To announce and study by each other either the condition of the volunteer activities carried out by the marine affairs educational facilities or the results in International Maritime Lectures Association Conference every year

The second step: "Build up the support system"

The support system of the volunteer activities by the seaman, and the workgroup or the organization shall be established.

The third step : "Recognition activities"

Either the organizations or groups carrying out the volunteer activities by the seaman continuously shall be recognized.

It would be the most important for the seamen like us and the members who are attending this conference and running through the forefront of the marine education need to cooperate and flexibly carry out the above activities tenaciously.

3. The future view of photo exhibition and plan

3.1 Contribution to the seaman and the marine affairs education

In the past, photograph exhibition 24 venues held abroad, more than half of them were held in the marine affairs educational facilities of each country. In addition to this, even in Japan, the requests to us from the marine affairs educational facilities are increasing in number year by year.

We would like to talk to the general public about the sea of world where they have never seen, the life on board and the voice on scene on board.

3.2 The expansion of the interchange in the global marine affairs society

By holding a photograph exhibition in each country of the world, every time, an exchange of opinions and interchange is repeated with not only marine affairs educational facilities but also Nautical Institution and Master's Association as well as other marine affairs organization.We hope that we can receive the reclamation of the source of the photographs and photographs from the members of IMLA and the other either teachers of the marine affairs educational facilities attending this conference or students / grads.

3.3 At the end

Lastly, I would like to finish this presentation by introducing the word of Daisaku Ikeda, SGI President and also is the world poet Laureate whom each Hato-kai member respects very much. "The spirit is expressed by the behavior, and it gives off brightness for the first time."

Not only idea, not only word, with the belief and behavior, we would like to contribute to the society, IMLA.

References

SGI

(Soka Gakkai International) (1975), in response to the needs of an increasingly international membership, the Soka Gakkai International (SGI) was founded. Today it is a worldwide network with 82 registered constituent organizations and over 12 million members in 192 countries and territories, sharing a common vision of a better world. SGI's Buddhist philosophy underpins a movement promoting peace, culture and education.

Soka Gakkai
The Soka Gakkai (literally, "Society for the Creation of Value") is a Buddhist association founded in 1930, which embraces Nichiren Buddhism, a dynamic philosophy grounded in the realities of daily life. This Buddhist practice leads to empowerment and inner transformation or "human revolution" which enables individuals to take responsibility for their lives and contribute to building a world where people of diverse cultures and faiths can live in peace. Now 8,270,000 families in Japan belong to Soka Gakkai.
Nichiren, a 13th century Buddhist reformer, based his teachings on the Lotus Sutra and its core message of the dignity of all life. According to this sutra, all people possess and can manifest the Buddha nature--an unlimited, inherent life state of freedom which enables them to create value out of any situation.

Daisaku Ikeda

Daisaku Ikeda is a Buddhist philosopher, an educator and a prolific writer and poet. As president of the Soka Gakkai International (SGI) lay Buddhist movement, he has devoted himself to wide-ranging efforts for peace and individual empowerment, and has founded cultural, educational and peace research institutions around the world.
Born in Tokyo in 1928, Ikeda experienced firsthand the tragic reality of war and militarism. In the chaos of post-war Japan, he came to embrace Buddhism through an encounter with the educator and pacifist Josei Toda, head of the Buddhist lay organization Soka Gakkai, who had been imprisoned for his beliefs during World War II.
These experiences shaped Ikeda's commitment to peace. Over the years, Ikeda has engaged in dialogue with many of the world's preeminent thinkers and leaders in search of viable responses to global problems, inspired the SGI's support of United Nations activities, and written extensively on a range of issues related to peace and the human condition.

Central to Ikeda's thinking is the idea that a self-directed transformation within the life of each individual, rather than societal or structural reform alone, holds the key to lasting peace and human happiness. This is expressed most succinctly in a passage in his best-known work, The Human Revolution: "A great revolution of character in just a single individual will help achieve a change in the destiny of a nation and, further, will cause a change in the destiny of humankind."
Ikeda's books, offering perspectives grounded in Buddhist humanism on the challenges facing both individuals in their daily lives and humanity as a whole, have been published in more than 30.

Hato-Kai

The Hato-Kai who is the sponsor of the photograph exhibition "Beyond the Horizon" is the group composed of the seafarers of Soka Gakkai on board of oceangoing vessel.

Main Photograph Exhibition at Yokohama

From 1987, in 21 years, at Yokohama in Kanagawa Prefecture, this Main Photograph Exhibition is continually being held. The 22nd is counted at this year. The photograph exhibition which is the main exhibition of "Beyond the Horizon"
About 50000 people enjoy the photographs at Yokohama Yamashita park which is a venue on these every year.

One mile exhibition
It is held in the schools, the public facilities, and so on in about 850 venues. The people who exceeded more than 200,000 people enjoyed the photographs. This is a photograph exhibition which one Hato-Kai member, by himself, has to look for the partner and venue, talks and decides everything, displays the photograph by himself, touches visitors and dose everything even the last removal.
A photograph to display with being an individual photograph exhibition is a part of the photograph used in Main Photograph Exhibition at Yokohama.

Environment one mile exhibition

One mile exhibition specified for the environmental issues. From the end 2008, which were held in the schools the public facilities and so on, it was already held at about 20 venues. The photograph exhibition appeals the environmental issues raised globally at present through the photograph, from the point of view of the sea.

The overseas photograph exhibitions

It was held in 24 venues until today. The photograph exhibitions in the foreign countries have been carried out with only volunteers of the Hato-Kai.
The countries and venues of overseas photograph exhibitions are as follows,
Vladivostok, Russia
Manila, Philippines
Shanghai, China
Cagayan De Oro, Philippines
Haiphong, Vietnam
Ho-Chi-Minh, Vietnam
Malacca, Malaysia
Dalian, China
Mumbai, India
Kharakhorumu, Mongolia
Kolkata, India
Jakarta, Indonesia
Tianjin, China
Dalian, China
MO HQ in London, UK
Regional Maritime University, Ghana

Do Seafarers Suffer From Culture Shock Or Do They Adapt

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Abstract

When an individual joins a ship, they move from their home culture to the new culture which is operating onboard the ship.They may have experienced a similar national or organisational culture in the past. But, on joining the vessel, they are unaware whether their personality will fit in or not. Normally, they will be able to fit in with the culture onboard the vessel; however, there may be occasions when they find some of their superiors or juniors impossible to work with.

Joining a new ship afresh each time will expose the individual to a shock each time. They have to learn how to operate the ship and how to follow the ship's operating system. At least, if they are working for the same company, the ISM system should be the same, unless they have changed ship type. However, if they join the same ship type, operating on the same run, this should help minimise some of the shock, as they do not have to learn everything from scratch. Back-to-back manning can allow people to return to the same ship, the same people and, hopefully, the same culture that they have experienced before. However, this may not be good if the culture onboard the vessel leaves the individual feeling exposed and likely to be removed from post. If there is a hasty and spiteful manager in control of the ship, or the department on the ship the individual works for, the individual may then rationalise that joining a new ship will leave them with some chance of being in an exposed position again, but less chance than joining the same ship again where the managers' position is known.

Within a company, the various styles of managers of various ships will become known within the fleet, and it may become less easy to man some ships than others, and it may become very difficult to man a particular ship. In such circumstances, back-to-back manning may be impossible to run.

1. Do seafarers suffer from culture shock or do they adapt

The term "culture shock" is used to describe the emotions and the individual's feelings when living in a new country or environment. When an individual joins a ship, they move from their home culture to the new culture which is operating onboard the ship. They may have experienced a similar national or organisational culture in the past, but on joining the vessel, they are unaware whether their personality will fit in or not. Normally, they will be able to fit in with the culture onboard the vessel; however, there may be occasions when they find some of their superiors or juniors impossible to work with. Joining a new ship afresh each time will expose the individual to a new culture every time. They have to learn how to operate the ship and how to follow the ship's operating system. At least if they are working for the same company, the ISM system should be the same, unless they have changed ship type. However, if they join the same ship type, operating on the same run, this should help minimise some of the shock, as they do not have to learn everything from scratch. Back-to-back manning can allow people to return to the same ship, the same people and, hopefully, the same culture that they have experienced before.

However, this may not be good if the culture onboard the vessel leaves the individual feeling exposed and likely to be removed from post. If we have a hasty and spiteful manager in control of the ship, or the department on the ship the individual works for, the individual may then rationalise that joining a new ship will leave them with some chance of being in an exposed position again, but less chance than joining the same ship again where the managers' position is known. Within a company, the various styles of managers of various ships will become known within the fleet, and it may become less easy to man some ships than others, and it may become very difficult to man a particular ship. In such circumstances, back-to-back manning may be impossible to run.

2. The back-to-back manning culture

With back-to-back manning, you would expect to offer more security (physical and job) and comfort (physical and psychological), than joining a different ship each time, the seafarers' leave is up, or their money has run out. Do seafarers have some materialistic trait?

Well, the material benefits may have encouraged them to go to sea in the first place. It is expected that there should be some materialistic bonus for being at sea. The seafarer may feel deprived of love and affection, their relationship and love needs will need to be squeezed into

that time when they are on leave. Back-to-back manning may offer the seafarer greater periods of leave and, at certain times of their life and their career, they will value these long periods of leave rather than greater rewards. At other times, leave is not the primary desire - it could be greater rewards, more sea service and, hopefully, quicker promotion.

The seafarer is hopefully joining the same ship on the same run each. They are familiar with the company's ISM system, and they are familiar with the ship and the people onboard. The seafarers may enjoy good relations with their colleagues onboard and their relatives ashore. They may depend on their minds, on their competency, skills and knowledge of the ship to ensure they are safe, secure and comfortable. These skills also insulate them from the company should the company fail, and they can take these skills and offer them to another company. They may be more inclined to keep working for the same company, even when they cannot pay as well as another, when they wish to keep stability in their lives. The potential dangers they face are being too comfortable and settled in one's thinking. Life at sea has many risks, and business rarely stays the same for long. All seafarers have to have desire to learn and study, that is how they progress from seaman to master. However, their thinking may develop to a level where that desire may be at odds with their desire to earn money and be materially secure. It would be reasonable to suggest that back-to-back manning offers less of a culture shock on joining than joining a new ship.

Nearly back-to-back manning is where you join "Ship A", do your tour, after the next leave, join "Ship B", and, then, after the leave following that tour, rejoin "Ship A". This enables the company to employ less of a leave-to-work ratio. But, often in these systems of work, you are still not employed by the company - you continue to be a peripheral worker in the same position as if you joined a new ship each time. So, the security gained is tenuous and not to be tested.

3. The New Voyage - An Individual's Decision

On joining a new ship for a new company, depending upon the rank of the individual and the company's policy, the only contact the individual may have had with the company is the contact with the crewing agency. Therefore, the individual is looking at the ship as being representative of the company and its culture as a whole. But, the first decision the individual must take is whether to sail on this vessel or not. Their first consideration, then, is the condition of the vessel. However, that cannot be considered in isolation - how much does the individual need this job? There may be monetary pressure on them to sail whatever the condition of the vessel; can they afford to pay to get themselves home should they fail to join? They are making a judgment on the condition of this vessel and, in order to do that, they will draw on the condition of vessels they have sailed on in the past. Therefore, the individual's previous experiences will have a great influence upon his decision to stay or to return home.

How many jobs are there out there in the market, if there are few opportunities, then the individual is much more likely to take the one that is offered? The decision is based not just on the survivability of the vessel, but the personal risks the seafarer is exposing himself to. In some states, seafarers have been prosecuted for accidents or incidents, especially those involving the environment. In recent times, security and piracy has been much more of an issue to take into consideration. When onboard the vessel for the first time, it is very difficult to absorb the culture onboard the vessel quick enough to make a rational decision about it. Too warm a welcome can mean trouble further down the line. There is also a "honeymoon period", where people are happy to see a new face and the individual's skills and personality is under evaluation by the people onboard; however, this usually only lasts for a few weeks.

Therefore, joining a new ship in a new company will offer some culture shock to the individual. It would also seem reasonable to say that, if the individual has done this a few times, then the shock will be lessened. However, if the individual comes to the view that joining this ship was a serious error, then the effects can be quite pronounced.

4. The Ship's Culture

Culture would imply that there is a way of living onboard the vessel. Culture has been defined sociologically as "the sum total of ways of living built up by a group of human beings, which is transmitted from generation to another". (Barnhart and Stein, 1963 p.327). Therefore, on joining the vessel, the individual may well get advice from their predecessor on how the vessel operates. The individual will not know if this is good or bad advice, so will seek confirmation, or will test it in some small way to see if it is in fact the case. The individual would become part of the structure of individual relationships that combine to produce a culture onboard the vessel. Certain relationships may have more influence on the culture than others. Certain relationships may work much better than others. This relationship will be influenced by how the individual completes their work, one scenario is the individual decides what work needs to be accomplished, and then plans, arranges and completes the task. The other scenario is they are given a task by a superior, told how to carry out the task, and how to ensure the task is completed. The individual will find it difficult if they have worked in the one way and, on joining, they suddenly have to follow the other way of working. On the one hand, the individual will be de-motivated and, on the other, they may find themselves out of their depth and requiring some help.

"Regime change", i.e., the act of replacing one regime with another is a term popularise by Bill Clinton. Onboard ship regime changes are not normally precipitated by revolution or a coup d'état. It is more likely that a senior manager onboard has come to the end of their time onboard the vessel, and are about to be replaced by someone new. This may have a huge impact on the ship's culture, and the life of the individual seafarer who is working for

this manager. They are used to the manager, they have got to know his likes and dislikes. Firstly, they will be greatly interested to know who the new manager is and, then from their sources onboard, may be on another ship, what they are like to work for. Knowledge that an unpopular manager is about to join can prompt many requests for early leave.

5. Cultural Diversity Onboard

Professor Geert Hofstede did extensive research into how values in the workplace are influenced by culture. The dimensions he uses to describe different individuals and their interaction with other individuals are there to predict and explain behaviour. However, you cannot explain, as a seafarer, how effectively or whether you can work with another individual, based solely upon their national culture. Not every individual may be representative of a national type, and therefore may not fit the mould. Professor Hofstede's dimensions are power versus equality; individual versus groups; masculinity versus femininity; risk takers versus risk avoiders; long-term versus short time.

Different cultures score differently in each dimension, and we tend to judge other cultures against our own. Therefore, we tend to judge other people's behaviour against what we consider to be the right way of doing things. It is important for the manager and colleagues not to be prejudiced against other cultures; not to be in denial about the differences between them, but to be tolerant of different cultures, and to respect and value the differences. Strangely enough, it is possible to be tolerant of one culture, but not of another. Seafarers learn to be tolerant of different cultures. There are some cultures where "yes" means "no", when faced with this dilemma, people of other cultures may well just repeat the question. This does not solve the problem - some other action needs to be taken to ensure they can carry out the task assigned. There is also a wonderful variety of signs that can be taken as an insult by various cultures, and feedback or criticism need to be communicated in a specific way to make it acceptable to the individual involved.

Cultural differences can have a large impact on how the ship, as an organisation, functions. Let us imagine the senior managers onboard are from one culture, and the rest of the crew are from another - should the managers change to another cultural group the way the ship operates may well change. In some ships, it is not the blend of cultures that is the problem ,it is the style of leadership itself which can cause problems for the individual.

6. Job Design Shock

When the style of leadership is authoritarian, in this role "the individual accepts without question the instructions from his superiors, and then adopts a policeman's role, as he forces his subordinates to carry out those received orders." (Moreby, 1975 p.31). The Britannica Concise Encyclopedia defines "authoritarianism" as the "principle of unqualified submission

to authority, as opposed to individual freedom of thought and action." If the individual is not used to this role, then it can come as a great shock to them. It can be the right approach when an emergency arises, however, on a day-to-day basis, this approach necessitates the leader being involved in every decision. This also forces the junior individual in this relationship into the role of a policeman only. This completely changes the way the seafarer performs his duties, and the job design has been totally changed, from a fulfilling one, to one that has low discretion, and not meeting the individual's upper level needs, and may cause the individual stress. (Bratton and Gold, 2003 p.167).

7. Isolation

The similarities between a ship and a prison are often expressed; of course, people do not get paid to go to prison. But, there are few institutions which require people to stay on site 24 hours a day for week, or even months. Many states encourage seafarers to stay onboard, and some states will view seafarers as criminals should they wish to go ashore. Even if they do get ashore, they are not allowed to enjoy a good night out because they must return to their ship fit for duty, and that is a requirement for all those months they stay onboard. Few people are employed in isolated positions for 8 hours a day, week in, week out. There are certain positions onboard where people do not get ashore at all. The numbers of people onboard are reduced as each technical innovation comes along, this leaves less people onboard to mix or converse with.

Sailors do not need cinemas and tiled swimming pools, as much as they need to be treated as whole, complete persons.(Moreby, 1968 p.18)Loneliness and depression, rather than the emotions seafarers come to live with, are traps that can catch the unwary during adversity. Should the seafarer find himself rebuffed by his colleagues for whatever reason, the social isolation they experience can cause them to withdraw further. The avoidance of further social contact or communication with their colleagues can rapidly lead to isolation and depression. The effect of this isolation and depression depends very much on their personality and the possible means of escape from the ship or the contract. It is something seafarers should look out for in their colleagues.

8. Technical Shock

Ships are becoming more and more technical; the operators of these ships have a steep learning curve on joining the vessel to become competent in operating a variety of systems. These technical systems and equipments are not common from ship to ship. As an example, the operating menu of a GMDSS is completely different between the manufacturers JRCC and Sailor. Traditional systems are being replaced with more electronic systems which the operators have to learn. As the ships have become more technical, the skills required to

operate them have changed, there is no requirement for the middle-skilled person any more. We still require the seafarer to paint the deck and keep a watch, but the individual that used to splice ropes and carry out many other functions, has been replaced by technology. Another effect of technology has been the more efficient use of the ship. But this has had a negative effect on the life of the crew.The crew supposedly have been compensated by higher wages, more frequent vacations and better shipboard accommodation.(Moreby, 1975 p.26)The less crew onboard, the easier it is to withdraw from social occasions. The night watches are no longer a group affair, the OOW and the AB may not socialise at all.

9. Dealing with tyrannical managers or colleagues

Seafarers should be treated fairly and consistently, and with dignity and respect, whatever their duties. Ships and workplaces should be free from undue stress, anxiety or fear of intimidation. But, if you are a seafarer, the reality is that you may come into contact with bullying or harassment at some stage of your career. Seafarers and others use several tactics when dealing with tyrannical managers. The first is to identify the manager for what he or she is. Even when one is suffering mistreatment, there is a tendency not to blame the person causing the problem, but to consider that they must be working under pressure or circumstances that are making them behave in this way. It may be some time before the mistreated realises it is not the circumstances, but the person themselves.

The Royal College of Nursing did a survey of nurses in 2005, that showed that just less than a quarter (23%) of nurses said they had been bullied or harassed by a member of staff in the previous 12 months. The author was taught as a child that one must stand up to bullying, that by not standing up to the person, that we encourage that person to carry on mistreating us.

Once the seafarer is aware of the mistreatment, then resistance strategies will come into play. Direct confrontation is the way the author was brought up, but this will cause intense anger on the part of the manager and, if they have the power to do so, probably dismissal from the ship and or the company. The most popular reaction is to leave the vessel and/or company. In fact, in a study conducted on this subject, 36% of people who have been mistreated took this route. They may well have tried other resistance strategies, such as a collective voice. This may take the form of a letter to the company complaining of mistreatment signed by many people. The manning agent will not read such a letter if it has not been signed by the master. However, if it is the master they are complaining about, this is unlikely to happen. Even taking aside a visiting company official may not result in success. The official can work for the management company and, therefore, have no influence on crewing matters with the crewing agency. The crewing agency works to a budget, and taking people off before their contract ends, will only increase their costs, so it is not in their immediate interest to investigate the matter. Collective voice may work if the individual is a member of a union, where these events can be brought to its attention.

Another way may be to bring the mistreatment to the attention of a port state surveyor. Most actions taken by the victims do not solve the problem. So does the seafarer leave the vessel, or do they stay onboard and put up with the mistreatment. Well, how much loyalty does the seafarer have to the company that is employing him/her? Where is the individual on their career path? If they feel stuck in a rut, this is just the impetus they need to seek out that new job. However, this can also be the opportunity to reach that next position on the ladder. The most difficult manager, or colleague, to deal with is one whose personality constantly flips from "Dr Jekyll" to "Mr Hyde". When you are never sure who you are going to meet, it puts great tension into every meeting. The European Community Shipowners' Associations (ECSA), and the European Transport Workers' Federation (ETF), have come together to produce a document that advises shipping companies and others in the industry such as crew agencies on what they can do to eliminate harassment and bullying. [http://www.itfglobal.org/etf/etf-ecsa.cfm (1st July 2010).]

10. Good Management

Good management on board a vessel will foster a relaxed, but not lax culture onboard the vessel, but how do good managers or leaders operate? Jack Sadler, in his book, recommends the system developed by Dr Adair. Dr Adair suggests that we should not look at the qualities that make a good leader, but look at the functions of leadership.

The idea is to recognise that groups of people, acting as a team, have certain needs and the leader must see that these needs are adequately met. (Sadler, (1983) p.124).

Good communication is essential for the safe operation of a vessel. Communication has to do with the way people convey messages to each other. Now, at sea, that communication may not be in the seafarer's first language. It is essential to ensure that the message has been received; feedback from the receiver is examined in a friendly way. Keeping all the crew abreast of events will limit the number of seafarers listening to the galley radio. For the manager, the key attribute is to listen.

Reverse communication, or communication that travels up the chain of command, rather than down, is all important. This is the culture to which all seafarers wish to join, and is often shown by people postponing going on leave. Morale is not something that can be bought well it can but only briefly, good morale follows a good culture onboard the vessel. This is where people feel valued where there needs are being catered for.

11. Employment shocks

When an organisation thinks of its workers as components that can be replaced at will. If a component from one country can be purchased more cheaply than another, then the company switches to this new source of components. Suddenly, seafarers from one country

cannot find work and have to look to other employment to sustain their family. Other workers look at their consecutive single contracts, and wonder how much security it gives them. The companies have long been offering these types of contracts for flexibility in their manning requirements. These seafarers are part of a peripheral workforce which can be hired and fired as the market dictates. It is not unusual for everyone onboard to have the same type of contract. Employers who use these contracts realise that the seafarer has no loyalty to the company any more. The seafarer will shift allegiance to the highest-paying company or move to a more lucrative part of the industry, when their qualifications allow it, as soon as the difference in pay overcomes their reluctance to move.

Some employers counter this with a loyalty bonus which will increase with the amount of time served with the company. But, where does the reluctance to move come from, well look above. If the seafarer has been working for the company for some time, they know the ships. By know, I mean they understand them technically; they know and understand the ISM system; they know and understand their job description and, hence, their duties; they know what the company culture is, and the safety standard of the ships they serve on. If they regularly serve on the same type of ship or the same group of ships, they may also have friends or seaboard acquaintances onboard. David Dearsley, Head of the International Committee on Seafarers, says "that there are three tiers of shipping company operations." "The top tier needs to attract and retain the brightest and the best seafarers, and offer whatever employment packages are necessary to secure their employment. The second tier of employers, and probably the largest group, generally mean well, but do not have the staff or resources to match the top tier. The officer shortage has no impact on the wages or other employment conditions of those in the third tier. Here, the employers are employing those who are poor financially or poorly skilled, or those who would not be engaged by the more reputable companies, and therefore they have no bargaining power."

12. Crewing Agent

The agent has in the fleet they manage, the crewing off, a ship with a tyrannical manager and/or colleagues onboard. How does the agent get another individual to join that ship? The first step for the lax agent is to ignore there is a problem at all, and if the individual asks if there is a problem, the second step is to deny that the problem exists. The crewing agent has a duty to supply those seafarers to the ship as they are required.If the seafarer has worked with the agency for a long time, then they may try the other seafarers first. If the individual has knowledge of the situation onboard, then the agent will need to coerce the individual into taking up that position. The usual methods are the carrot and the stick, the carrot might be being considered for promotion after completion of this trip, and the stick could be dismissal from the company. The seafarer will ask the ship name, the location of the ship, but may not ask who is onboard, or what the culture or morale is like onboard the vessel.

The agencies' problem is the hidden nature of the problem: they may have received a letter from a group of individuals about a person onboard the vessel, but how can they effectively monitor the situation onboard to understand if the claim is valid or false. Different nationalities and customs can also mean that, while one nationality may find some action perfectly acceptable, another may find it a serious insult. One way is to have someone visit the ship, a "contact" person whom the seafarers trust, who can take the temperature of the culture onboard the vessel. The contact person should be able to offer advice to the seafarers on how to pursue this matter in the event of it being justified. (Einarsen, (2003) p.252) The agencies' policy should be to intervene where cases of harassment are found. Harassment is often on the grounds of sex, race, nationality or national origin, disability or sexual orientation. Harassment can be classified as, behaviour which seriously detracts from the social well-being of another person onboard, which is a Paragraph 9 offence under the Code of Conduct and, therefore, is most probably in breach of their contract of employment.

Agencies find it very hard when they have spent a lot of time and money attracting a seafarer to the company only for them to do one trip and then leave the company. One way of increasing the chances of retention is to mentor the employee on their first ship with the company. The senior seafarer takes the junior seafarer under their wing to teach them their duties onboard the vessel, to orient the seafarer to the company's ISM system, and to address any social or personal issues that may arise. (Olson, (2009) p.56) The difficulty is picking or arranging for the mentor to be on the ship the new employee is going to join, without disadvantaging the mentor.

13. The Shock of Being Home

When the seafarer arrives home, they have moved from a situation where they are constantly making decisions, taking responsibility, to a position of idleness and leisure. Whilst their family are very pleased to see them, they are a disrupting influence on their schedule and their lives.

In her book, "Homeward Bound: A Spouse's Guide to Relocation" (Expatriate Press 2000), Robin Pascoe defines reverse culture shock this way: "(It) is simply the shock of being home. Feeling like a foreigner in a foreign land is expected; feeling a stranger in your own home is not." But, the seafarer may well feel this way, and by the time they do fit back into their own home, it is time to leave again for that next trip.

14. Conclusions

The industry is becoming more and more specialised, technology continues to develop at a pace, and there is already a situation where seafarers need extra training for the handling of

oil, chemicals and gas. Seafarers already need extra training for the handling of people, especially passengers. It would seem likely that the technological shocks will continue. Meeting someone of a different nationality or culture is routine in our world today, but living with them in a group is still not the norm. However, the seafarer rapidly gets used to this aspect of their lives and even looks forward to the interesting developments it can bring. Having a senior manager tell you that you are not doing your job properly, and that you will do it this way, is a shock to anyone, and is not something you get used to. The new voyage shock is something that can be adapted to or, rather, the effects minimised by having gone through the same routine of joining a new company and a new ship a few times. Maybe seafarers look to find a company they feel settled with, it may be associated with getting older and being more risk averse.

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Research Seminar in Transportation in the Undergraduate Maritime Programs

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Abstract

Research seminar in transportation requires an individual research paper/project from the undergraduate students. The course objective is to integrate senior students' skills obtained through the years of study into a project/paper followed by a presentation to the class. This is a critical opportunity to teach the students the skills of research and making a presentation.

In offering this required course, the college offers the student an opportunity to sharpen skills, diversify knowledge, test his/her personality, learn time management and, last but not least, reach out to an ambition or achieve a dream, all of which is embedded in the topic selected. Obviously, after doing all this work, the student has to sell the project to the class in a presentation utilizing any technology he/she chooses and his/her charm. Furthermore, this course could also be perceived by the student as the first step to test his/her self-worth, a critical step in a long career. The seminar builds up the student's confidence, research skills, and leadership skills, skills that are frequently overlooked in earlier years of study but are critically important for success in the long run.

This paper draws on over 30 years of experience teaching a research seminar in transportation to maritime students at SUNY Maritime College. The paper is divided into several parts addressing: the methodology or the description of the course and its requirements, research topic selection and modifications, class interaction and coaching of research methodology and research writing, including one-on-one coaching, the importance of deadlines, presentation preparation and delivery. The paper also provides the grading methodology, a seminar analysis, assessment of results, conclusion and recommendations.

1. Introduction

University programs that specialize in maritime education focus on a niche market that requires ordinary skills and additional skills associated with this market. The additional skills are very well defined and require specialized education and training. The niche market, in addition to the ordinary courses, could include a combination of courses in the areas of logistics, supply chain management, business of shipping, port and terminal management, chartering, insurance, maritime law, and others. Students who opt for a license also have a long list of additional required courses and exams in order to comply with the license requirements, including a very high passing score to qualify for the license. A license student will end up taking in excess of 30 percent more courses than a non-license student. Thus, the students are under a great deal of pressure.

Throughout the years of study, the students obtain a great deal of information that can be classified as generic or general and specialized for the maritime business. As the students approach graduation, they decide about a career path that might or might not be associated with their course of study. In either case it could be very helpful if they learn how to integrate their studies in a project. The required research seminar in transportation provides this function.

Research seminar in transportation requires an individual research paper/project from the undergraduate students. The course objective is to integrate senior students' skills obtained through the years of study into a project/paper followed by a presentation to the class. This is also a critical opportunity to teach the students the skills of research and preparing and presenting their presentation. These skills could be very helpful for the graduate in the later years of his/her career.

The course draws on the professor's experience of more than 30 years teaching this course, fine tuning it and developing a methodology that has proven successful in motivating the students and obtaining good results. The paper is divided into several parts addressing: the methodology or the description of the course and the requirements, research topic selection and modifications, class interaction, coaching of research methodology and research writing, including one-on-one coaching, the importance of deadlines, presentation preparation and delivery. The paper also provides the grading methodology, a seminar analysis, assessment of results, conclusion and recommendations.

2. Methodology

The seminar is designed to bring together skills obtained during the course of study from all the disciplines the college offers. The disciplines include general education courses, major courses and license courses if applicable. The objective is to train the student for life after college and mimic a real work environment.

The seminar starts by students receiving a course outline (see appendix 1) and an over view of the course emphasizing that it is different from other courses and that the students

have to follow the outline very carefully. The course outline includes the course requirements, deadlines, grading methodology and an assessment statement.

There are four stages of the seminar: topic selection, topic outline development, research writing and presentation. Each stage is discussed separately with the details associated only with the stage at hand. The transition from one stage to the next evolves with time as indicated in the course outline. Discussing a stage before the appropriate time might be overwhelming for the student and even confusing. Nevertheless, some overlap takes place.

2.1 The first assignment is to select a research topic within two weeks

Once the topic and outline are approved, the students are charged to work on the research on their own and provide oral progress reports and raise questions and concerns in the weekly class meetings.

Attendance is required and students have to meet deadlines. The deadline includes submitting on time: the research topic, the research/project outline, and the complete research/project paper. Missing a deadline or class implies a loss of grade points. The deadlines are very tight and they might seem very short; however, when students were given more time, they still did the work at the last minute. Therefore, a tight schedule provides for more flexibility and the opportunity to correct and gets the job done on time by all.

In the last two to four weeks of the semester, the students concentrate on presentations. A presentation is usually a power point presentation of about 10 minutes or 8 to 10 slides. When students work on presentations, class discussions turn to slide preparation, visualization, and the information a slide should contain. At the end of the presentation, there is a question-and-answer period of up to 2 minutes. During the last month of the semester each student signs-up for a presentation slot from a list of available slots. The student is responsible to make the presentation during this time slot.

The grading for the seminar is made up of a few components. The most important one is the research itself (70%), followed by the presentation (15%) and attendance (15%). However, missing a deadline has a price of 2 points from the grade. The grade is based on a variety of issues including: introduction, methodology, analysis, writing, conclusions and recommendations (see appendix II for the Grading Rubric).

2.2 Seminar topic selection, modification and development

The seminar meeting starts with the selection of a research topic. The topics a student can choose from are quite liberal. The recommendation is to select a topic that the student cares about or a subject that the student wants to be engaged in in his/her career, thereby assuring the student's interest and commitment to do a good job. Initially this requirement causes many students a great deal of concern, confusion and anxiety. For most students this is

the first time that they are engaged in writing a research paper (project). Thus, they may not know how to approach a topic or proceed once a topic is selected.

The first meeting is used to demonstrate what types of topics are acceptable. At this meeting students offer very few titles for discussion. The discussion is designed to demonstrate how to approach a topic and it leaves the student with the assignment to get a topic for next meeting. In this effort the student is expected to do research about potential topics.

In consequent meetings every topic offered is discussed attempting to develop a preliminary outline. In order to ease concerns, confusion and anxiety, a discussion which includes examples of research topic development takes place. The students are asked to share their thoughts about the topics they have in mind. Once a student offers a topic, it follows with a dissection of: meaning, feasibly to obtain data, sources of data, difficulties and concerns of handling the topics, relevance, expected results, tentative paper structure, duration of completion, expectations of quality, and others issues including plagiarism.

Every topic offered is scrutinized. At the end of this stage, while listening to all the topic discussions, a student has a good idea of what is expected and how to proceed. During this stage some students change topics, others expand the research and others trim it down and add focus. Some of the modifications take place due to different realities, such as data not available, beyond the scope of an undergraduate level research, not fully understanding the meaning of the subject and others.

2.2.1 Every topic submitted is changed

The topics selected must be different from each other; if they are similar they are steered towards another topic. Furthermore, the topics should not be the same as any from the last term; if offered, the topic is steered away to another topic or a different dimension of the issue. The changing or modifying of a topic is in order to challenge the student to be a critical thinker and in order to eliminate or reduce of the risk that a student is planning to plagiarize. At the end of the process, there is a diversity of research topics. This process takes a few class meetings and, if needed, also individual office meetings.

All the discussions are designed to be in class for all the students to hear and learn how an outline is developed and be aware of the complexity, concerns and expectations. At the end of this process, every student hands in a tentative course outline including preliminary conclusions and a preliminary bibliography.

In the early part of the semester during the topic selection stage, the concerns are primarily associated with data availability and collection, data accessibility through the library or other sources including interviews. After the first types of concerns are resolved, there are new concerns of research methodology and interpretation of results, which were deferred before and are now high on the list. After these are resolved, the research writing and

reporting become the most important issue. Obviously, there are many meetings addressing these issues. All issues and concerns are discussed primarily in class; however, there are also individuals who prefer to meet in private.

2.3 Seminar presentation development and delivery

A student is required to present his/her work to the rest of the class. Since each student is works on his/her research on his/her own, there is very limited opportunity of sharing research methodology and results and/or knowing what the others do. The student's benefit is to listen to each other's work, thereby expanding and diversifying his/her knowledge.

Parallel to writing the report, the students are advised about the class presentation. The emphasis is on the dissemination of the information obtained through the research and sharing it with the rest of the class. The presentation is designed to emulate the atmosphere and environment of a professional presentation. The general approach in the presentation is to provide appropriate information and be simple and clear. Some students opt to add a movie to the presentations. Other students prepare very colorful and dynamic presentations with illustrations. The speaker is instructed that while presenting, he/she is expected to use a very limited amount of notes preferably without any notes. The speaker is also encouraged to be: dynamic and fluent and demonstrate his/her command of the information; some humor is a plus.

The last segment of the course is intense and at times exciting. The students are expected to make the presentation in the time slot they signed up for. Missing the presentation automatically drops the student to the end of the list for presentations. Since the presentations are at the end of the semester, there is a possibility that the student will miss the presentation altogether and will pay the consequences.

3. The research seminar: an analysis

The seminar has a few objectives emphasizing different issues that are important for graduates to possess in the working environment at different stages of their career.

- The leading objective is for the student to integrate and sharpen skills obtained through the years of study and gain confidence by demonstrating his/her knowledge with imagination and creativity.

- A second objective is to demonstrate the explicit skills of: research, analysis, writing, and communications.

- A third objective is self-testing the student's implicit skills of: time management, accuracy in delivering information and crediting sources, commitment, innovation and imagination, sincerity, leadership, confidence, creativity and others.

The first objective is achieved through teaching and coaching. The research seminar is not handled like an ordinary course. The information delivered during the class meetings is directed to a task defined by a research topic (or a student). Each project is different. Each student is instructed differently in order to achieve his/her objective. However, there is a common denominator or a model behind the process. The students are listening to the instructions to their peers and trying to deduce the information provided to the classmates for their own research. This information delivery methodology is both rewarding and challenging, especially when the instructor is not familiar with a topic. Therefore, the students pay attention very carefully to every detail. The script of how to handle a topic changes minute by minute, topic by topic. Given these circumstances the students pay close attention and try to extract what they can use for their own project.

The experienced instructor also has an opportunity to provide new information associated with a topic, raise questions that should be answered and offer an approach or methodology to answer it. All the instruction and discussion is geared towards the paper/project, not an exam, and can be utilized right away from one meeting to the next. The instruction is also used for motivating the student.

The focus of topics students selected through the years changes; it identifies the student interest and it could be an indirect indicator of social interest as well. For example, through the years there were clusters of interest in studies associated with issues of: container vessels, ferries, marinas, Panama Canal, environment, energy, LNG, piracy, and the development of a private business. In the last few years the environment, energy and piracy are the leading topics.

During the instruction an effort is also made to explain the concept of plagiarism, which grew to be very critical at the age of the internet. The attitude to plagiarism differs by culture and country of origin. The students attending the seminar are global. Therefore, an effort is made to minimize/eliminate the potential of any level of plagiarism addressing and providing examples by country and culture as well.

Achieving the second objective is divided into four parts. The research topic selected indirectly determines the type of research methodology required. For example, a quantitative topic requires different skills than a qualitative topic. Either one draws on the courses taught but the focus might be on different courses. Some quantitative topics require skills beyond the level covered in class. In those circumstances the student might be asked to obtain the skills by himself with the guidance of the professor. The professor might even tutor the student. The last happens infrequently.

The student search for information is directed to books, review journals, newspapers, professional journals and magazines and the internet. However, many try to get all the information via the internet. As internet resources are increasing in scope and substance, the students are able to increase the internet share as a source of information. Obviously, the internet is still not the source of all the student's information needs.

In general, the guiding principle for analysis is to encourage the students to answer the question "why" in their research. For example, why did the LNG industry develop at the time it did? Or, why did shipping companies lay-up ships at the time they did? Or, why did container builders start building them again? The other guiding principles for research are when, where, and how.

The analysis a paper requires depends on the topic. As indicated before, a quantitative paper is different from a qualitative paper. The analysis in a quantitative paper could include a range from basic statistics tools to sophisticated tools. The students are encouraged to carry the analysis to the maximum they can handle and then some. This requires the student to go back to the course material studied in the past and beyond. In a few cases, since the statistical analysis was beyond the student's ability, the professor stepped in to assist in using more sophisticated methodology and the interpretation of the results. Obviously, the objective in this circumstance was also an attempt for preliminary research that will subsequently lead to a publication. In cases of qualitative research the methodology used is logic, deduction from information, reasoning, description of a process, analysis of a law, and others. Many students opt for this type of research because they feel more comfortable with this methodology.

The research results are submitted in writing. For many students the research seminar is the only long paper (minimum 20 pages) they write. Therefore, they have to struggle with a paper outline, citation, quotations, language, focus, visual presentations and integration, etc. A part of the instruction addresses these issues. Students are encouraged to use visual information such as tables, charts, figures, and even pictures if appropriate. In order to assist students in their learning effort and improve the quality of the papers, students are encouraged to submit a draft of the paper two weeks before the paper due date for review and comments on the overall coverage of the subject, paper structure, referencing, language, etc. A preliminary review gives the student the opportunity to improve the paper. However, only 10 to 20 percent of the students take advantage of this offer, usually not the students who need the assistance.

The student communication skills are developed and tested in the preparation and presentation to the class. The presentation prepares the student to explain the research and its results to the rest of the class as if it was at a work or research environment. The student has to make the presentation within 10 minutes and be able to answer questions at the end. The presentation must be structured to provide complete information, flow, clarity and substance, and be convincing. The student is encouraged to speak without notes. After all, at this time the student is an "expert" on the subject and he/she should be able to sell the work to an

audience, in this case, a class. Unfortunately, some students still need the assistance of various written aids to complete their presentation.

The process of achieving the third objective of implicit skills addresses various manners. For example, meeting tight deadlines and providing progress reporting teaches the student time management. The conscientious student follows all requirements and moves forward on schedule to complete the report on time. During the semester the instruction indicates where the students need to be in order to complete the project on time. Therefore, very early in the semester it becomes very clear how the students manage their time and who will complete everything on time. The class sessions reinforce the time management issues as well.

An important issue is the accuracy in delivering the research information and crediting the sources. Students are required to provide the references of their sources in a standard referencing methodology. Each student is free to select a method that he/she is most comfortable with. The requirements of footnoting and referencing assure the accuracy in information delivery. There are students for which this is their first time of referencing a source. This effort teaches the student the importance of crediting sources.

A student's selection of a topic is a commitment and sincerity to the research issue and to completing the research and its results. The commitment is to investigate the topic and accept the results even if they are opposite to their initial thoughts.

The student selection of a topic could indicate innovation and imagination. There are topics that require a great deal of imagination and creativity and for some it is reaching out to an ambition and a dream. These students need a great deal of motivation. Most students are very practical and pragmatic in topic section. However, from time to time there are those who are different; for example, a study of the feasibility of moving coal from underdeveloped areas in Africa via blimp to a port for export; the study of the use of passenger ferry from Atlantic City to New York City for the purpose of starting a business before this type of business was available. This idea actually materialized when, a short time after the student's graduation, a business of this type started by someone else.

Student selection of topics also shows leadership and confidence. There are research topics that are difficult to investigate; others require interviews, persistence or unpopular topics. Thus, pursuing them, in spite of all the uncertainty and difficulties, is a form of leadership and confidence. Leadership and confidence could also be demonstrated through the presentation and command of the class attention during presentation.

4. Seminar results assessment

The seminar requires motivation speeches to the students, frequently generating positive comments such as: this was very exciting, I wish I had this class earlier, I leaned a great deal, I cannot believe I was able to do all this, I understand better what I want to do, I did not

realize research is so difficult, etc. The majority of the students complete the requirements on time with a high grade.

However, the effort to encourage and assist the students in writing a good paper could be difficult. The difficulties encountered can be classified as: poor attitude, poor learning habits, and low self esteem. Very few students will simply not attend classes and/or not provide a presentation. There is a small group of students who have difficulties in writing and need the assistance of an editor. Another small group is the students who are off target, do not know how to structure the paper, and do not follow the instructions and/or corrections. The most common mistakes, even by the ones who do well, are not providing all the references and footnotes and/or providing visual information such as tables and graphs without integrating their information into the paper. Some different issues are the desire to avoid quantitative analysis, insufficient research, and stating conclusions without proof.

5. Conclusion and recommendations

Research seminar in transportation requires an individual research paper/project from the undergraduate students. The course objective is to integrate senior students' skills obtained through the years of study into a project/paper followed by a presentation to the class. This is a critical opportunity to teach the students the skills of research and making a presentation.

In offering this required course, the college offers the student an opportunity to sharpen skills, diversify knowledge, test his/her personality, learn time management and, last but not least, reach out to an ambition or a dream, all of which are embedded in the topic selected. Obviously, after doing all this work, the student has to sell the project to the class in a presentation utilizing any technology he/she chooses and his/her charm. Furthermore, this course could also be perceived by the student as the first step for a student to test his/her self worth, a critical step in a long career. The seminar builds up the student's confidence, research skills, and leadership skills, skills that are frequently overlooked in earlier years of study but are critically important for success in the long term.

6. Recommendations

A research seminar should be a part of every undergraduate program. The long-term benefits of the experience and exposure could be critical for an individual's growth in the form of graduate school, promotion, getting a job or an internship, self-determination, confidence builder, or leadership. Through the years many graduates indicated that the seminar made a difference in their career and in giving them the confidence they needed to compete for a promotion or a new job. For the faculty member this could be an opportunity to start a new project with the assistance of students.

Appendix I

Maritime College
Seminar in Transportation Economics
Meeting Days: xxx **Room:** xxx **Office Hours:** xxx
Dr. S. Yahalom (email**)**

Fall 2010

This **research** seminar is the conclusion of all the years of study in Maritime College. In the seminar we would like to see some of the tools you have learned at work.

Course requirements

a. The student is required to **write a research project/paper** (minimum of 20 pages, 1.5 spaced and standard margins and letter size).
b. **The student, with the advice of the professor, will select a research topic**. **ALL topics must be approved.** All changes in topics must be approved by the professor.
c. The **proposed paper/project title** should be submitted in **writing** by **September 20, 2010**. The title **must** include (one page):
    - Paper/project title
    - Student name
    - Student ID number
d. **Complete proposal**. The student **must** submit, in writing, by **October 4, 2010,** a proposal that includes the following (each page of the proposal must include the student name in the header):
    1. A title page (project title and student name) – one page
    2. Research problem or research objective statement – no more than 500 words on one page explaining the research objectives
    3. A tentative paper/project outline – one page
    4. Research methodology/technique to be used – one page
    5. A tentative conclusion(s) - one page
    6. A partial bibliography (the bibliography should be at least 30% from books and recent review articles – last 10 years) – one page
e. **First draft** (optional) is due on **November 1, 2010**.
f. **Final paper (hard copy)** is due on **November 15, 2010**.
g. **CD of presentation and paper** are due on **November 29, 2010** or before.
h. **Project presentation** – Students are required to make a 10-minute class presentation of their paper/project. Presentations will start on **November 1, 2010**.

i. **All papers must be submitted for plagiarism[1] evaluation – "Turn it in".**
j. Class discussion will include the transportation topic associated with student's research. The class meetings will also include questions and answers regarding research and project writing.
k. **Attendance is required**.

Evaluation: paper/project (70%), presentation (15%) and class attendance and submission on time according to the schedule above (15%). Missing a deadline results in 2 points reduction in the grade.

Anticipated Course Outcomes: The student who successfully completes the course will be able to: identify issues clearly, formulate hypotheses and collect and evaluate data; express ideas clearly, concisely and persuasively; integrate ethical viewpoint and comply with the principles of academic integrity. If the student selects an international topic, including a transportation management topic, he/she will understand the dynamic issues of international management, including principles, skills, and tools. All students will apply leadership skills in obtaining the data and presenting the research results.

[1] See "Academic Integrity" policy on the College website http://www.sunymaritime.edu/Academics/index.aspx

Appendix II

Grading Rubric for the Seminar in Transportation

	95	85	75	65
Introduction	Clear: background, paper objective and direction	Brief: background, paper objective and direction	Some: background, paper objective and direction	No: background, paper objective and direction
Methodology	Clear methodology used to obtain the research objective	Some methodology used to obtain the research objective	Reference to methodology used to obtain the research objective	No methodology used to obtain the research objective
Analysis	Clear use of methodology to study the data	Some use of methodology to study the data	Reference to methodology to study the data	No use of methodology to study the data
Writing	Excellent organization, no grammar errors, concise, appropriate use of references, integrate figures and tables into paper text	Good organization, some grammar errors, concise, appropriate use of references, integrate figures and tables into paper text	Good organization, grammar errors, some use of references, some integration of figures and tables into paper text	Some organization, grammar errors, poor use of references, little or no figures and tables into paper text
Conclusion and recommendations	Consistent with paper, logical, supported by research	Based on paper, somewhat logical, supported by research	Based on paper, with some support by research	Based on paper
Bibliography	Comprehensive use of: review journals, journals, news reports, books, internet	Partial use of: review journals, journals, news reports, books, internet	Some use of: journals, news reports, books, internet	Some use of: old news reports, books, internet
Presentation	Fluent, dynamic. Humor, control of facts, command control of class	Slow. Control of facts, command control of class	Slow, some control of facts, no command control of class	Sloppy, no command control of facts or class
Attendance	Lose of a point for each class missed for a maximum of 15 points			
On-time delivery	Loss of two points on every missed deadline			

Improving the Course Education to Upgrade the Psychological Quality of the Students of Seafaring Specialties

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Abstract

It is recognized by the maritime industry that human factors including seafarer's psychology problem have contributed to most of the ship accidents. Therefore improving the psychological quality of navigational students has great significance on enhancement of the maritime safety. Based on the observing and survey of seafaring special students of Shanghai Maritime University (SMU), this paper discussed the background of psychological quality education of them and introduced the experience of SMU on how to implement Psychological Quality Education as well as methods to upgrade the psychological quality of navigational students.

Keywords: psychological quality education, seafarer's psychology problem, navigational students.

1. Introduction

Nowadays the world's maritime industry is dynamic, scientific progress has brought increasingly advanced equipment for ship communications and navigation, and the seafarers' educational and cultural qualities have kept improving. However, the rate of maritime accidents remains high. Investigation shows that the causes of the accidents can be attributed not only to ship sizes and types, climate conditions, cargo, and the crew's skills, but also to the human psychology.

In the past years' educational work, I have observed the students of the seafaring specialties, including their motivation for the studies and the relevant psychology. Extensive surveys of seafarers indicate that the uncertain, risky and independent nature of the seafaring occupation exerts a great influence on their psychology. The stress they experience has a bearing on their psychological wellbeing. To improve the psychological quality of the seafaring students, we have developed a comprehensive educational system, proposed more ways for their psychological education, and made feasible suggestions on how to improve their psychology.

2. The Background of the Psychological Quality Education of the Seafaring Students

The majority of the seafaring students are from remote villages and mountain areas, with a family of sisters and brothers. Most of them are "older" students re-attending classes after failing the college entrance examination. With similar special background and specialties, they entered Shanghai Maritime University (SMU).

Most students had mixed feelings about choosing the seafaring specialties at SMU: some had determined to enter a military school, but failed with various reasons. When they saw "semi-military closed management" on the SMU admission brochure, they began to anticipate their university life; some who had unstable grades in high school had to choose the seafaring specialties, since they were among the pre-enrollment specialties with a lower minimum admission score; some learned from their high-school class teachers that they could earn handsome salary in seafaring field after graduation from SMU without worrying about finding a job; some just intended to further their studies in Shanghai, regardless of universities and specialties; some, after re-taking classes for years, were unable to stand the pressure of flunking the competitive examination for college admission; some hoped to migrate from the rural areas to Shanghai and improve the financial condition of their family. However, the students knew nothing about the turbulent, risky, tough, independent and uncertain nature of the seafaring occupation. Studying in the seafaring specialties with these thoughts and motivation in mind, it is self-evident that the students will suffer psychological problems in their future job.

The relevant research data indicate that seafarers in service need to bear much more psychological pressure than those who undertake other occupations. Mental health problems of seafarers have also raised attention of the researchers from domestic seafaring colleges and maritime shipping company management staff at all levels. IMO (International Maritime Organization) has been improving ship performance and hull's structure, but at the same time, it has been attaching more importance on the research of human factors. To understand the psychological state of seafarers, we have, by using the favorable conditions of maritime education and training programs in SMU, surveyed a wide range of seafaring students and senior seamen and used the symptoms checklist for mental evaluation and psychological file management system to analyze the present psychological state of seafarers. We have obtained some valuable findings.

The survey indicates that the seafarers' main psychological problems are obsession, interpersonal sensitivity, depression, and crankiness, meaning that sailing on the sea is a life event, in which seafarers have depression, anxiety, sleeping problems and other reactions. The bottom reasons of these problems are the bad sleeping condition and circadian rhythm disorder caused by continuous sailing duty. Another reason is related to their sailing on the sea over a long period of time, being far away from their spouse, feeling lonely and solitary, with few contacts with the opposite sex. Other factors such as monotonous working

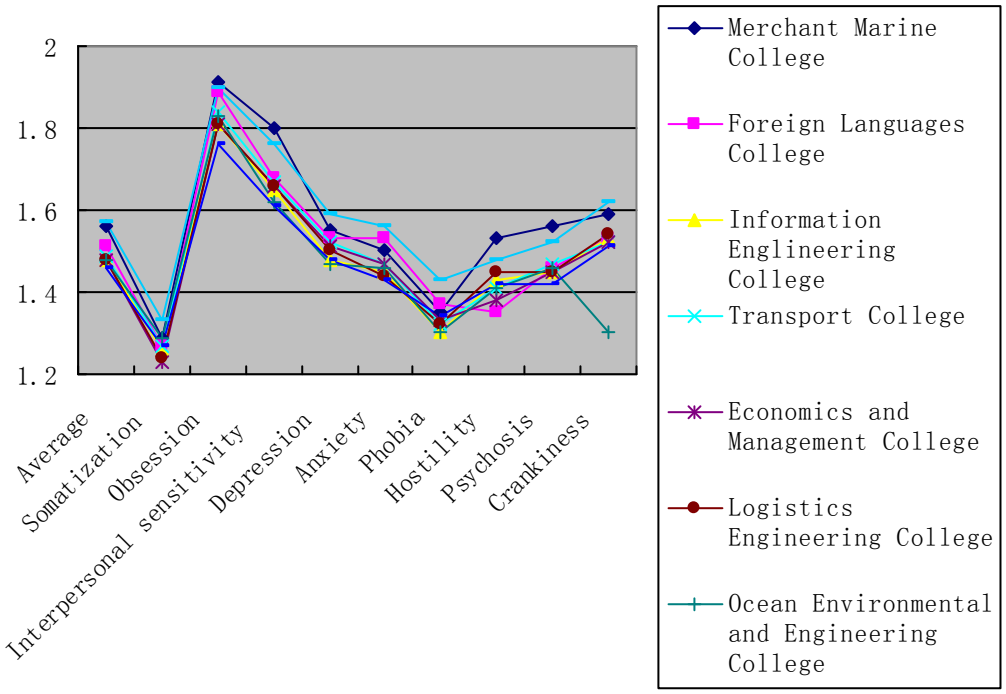
environment on the ship, dull and boring leisure activities, varied stress resources, high work pressure and mental strain resulting from exhaustion or accidents etc. also have something to do with these psychological problems. Consequently, the long-term sailing and biological rhythm disorder produced by shift work and physical decline caused by lacking exercises and aging lead to many physical and psychological problems of the seafarers.

Through the survey on seafaring students' mental state and seamen's mental health, we find it extremely urgent to launch the psychological quality education of seafaring students.

Table 1. The score statistics of SCL90 scale factor of 09 students of SMU

	Average	Somatization	Obsession	Interpersonal sensitivity	Depression	Anxiety	Phobia	Hostility	Psychosis	Crankiness
Merchant Marine College	1.56	1.29	1.91	1.8	1.55	1.5	1.35	1.53	1.56	1.59
Foreign Languages College	1.51	1.27	1.89	1.68	1.53	1.53	1.37	1.35	1.46	1.53
Information Engineering College	1.48	1.26	1.81	1.65	1.48	1.45	1.3	1.43	1.45	1.53
Transport College	1.49	1.27	1.84	1.67	1.52	1.47	1.32	1.41	1.47	1.52
Economics and Management College	1.48	1.23	1.81	1.66	1.51	1.47	1.33	1.38	1.45	1.52
Logistics Engineering College	1.48	1.24	1.81	1.66	1.5	1.44	1.32	1.45	1.45	1.54
Ocean Environmental and Engineering College	1.48	1.29	1.83	1.62	1.47	1.46	1.3	1.41	1.46	1.3

Liberal Arts and Science College	1.46	1.27	1.76	1.61	1.48	1.43	1.34	1.42	1.42	1.51
School of Law	1.57	1.33	1.9	1.76	1.59	1.56	1.43	1.48	1.52	1.62



3. The Concrete Implementation of the Seafaring Students' Psychological Quality Education

The fundamental objective of psychological quality education is, first, to get rid of psychological disorder, promote mental health and enhance mental fitness; second, to develop potential abilities and improve mental development. Through the survey and analysis of the seafaring students' psychology, the author found that compared with students from other colleges, seafaring students show certain different psychological characters especially in obsession, interpersonal relations, hostility, and crankiness. In addition to the common causes of psychological problems of college students, there are seafaring students' personal reasons.

At present, most seafaring students in domestic shipping colleges and universities are from rural and poverty-stricken areas. They have a sense of inferiority and lack self-confidence. As a result of the growing environment, they have formed the personality of self-isolation. In socializing, they are often self-centered, over-sensitive, suspicious, and self-denied; thereby they have fallen into a state of depression and anxiety. In addition, the students are short of understanding of this special profession, particularly its tough, risky and dull nature, which leads to the feeling of confusion about their future. They feel depressed and

downhearted mentally and psychologically, which is likely to induce psychogenic disorder and even mental diseases.

The course "Psychological Adjustment and Development of Seafaring Students" is mainly aimed at solving the above-mentioned problems. Taking "personality development" and "mental health" in psychological quality education as the mission, the course gives priority to solving problems of future seamen's mental health and sound personality development, guiding the students to adopt a correct attitude toward the seafaring occupation and get fully prepared physically and mentally to meet optimistically the challenges of the future work.

The course is problem-oriented in classroom instruction. Using the teaching methods such as special topic discussion, case analysis, and practical operation of skills, the course has created a teaching model with special purpose, involving the traditional cognitive inculcation, group counseling, individual case persuasion, and practice reinforcement.

3.1 Cognitive Inculcation

In the teaching practice of seafaring students' psychological adjustment and development, the author combines the theories of psychology with the occupation traits of seafaring students and their mental health, which helps the students approach their occupation with proper mentality. The final goal is to spur the change of behavior, correct cognitive deviation, relieve their bad mood, improve interpersonal relations, and develop their potentiality.

We use the Beck cognitive therapy to modify beliefs and identify distorted thinking among seafaring students. The Beck cognitive therapy initially focused on depression, for depressed patients always hold a large number of negative views, leading to their negative beliefs to themselves and the outer world. Symptoms include taking a negative attitude towards oneself, one's past experience and future. The aim of the Beck cognitive therapy is to help the patient make clear cognitive blind spots, vague perceptions, self-deceiving, incorrect judgment and change his distorted understanding of the reality and illogical way of thinking. A therapist, instead of using authoritative methods, treats the patient with acceptance, warmth and empathy, through which he leads the patient to be willing to enter the course of solving problems by trying learning from mistakes.

The basic theory behind the Beck cognitive therapy is the theoretical model of information processing, which holds that cognition decides behavior and feeling. For example, people among a dangerous environment would feel anxious and intend to escape from it. Cognition is based on attitudes towards past experience and assumptions.

Beck insists that people, through incorrect cognition processing, form psychological barriers out of distortions in the patient's perspectives and errors in thinking, including subjective conjecture, arbitrary inference on an unrealistic basis or in an absence of evidence, exaggeration of the significance of a certain accident, self-inclusion and intending to connect

oneself with unrelated affairs, going extremes with a view that everything is either good or bad.

Beck also points out that incorrect thoughts usually come to one's mind automatically, which means that those incorrect thoughts turn out unconsciously and habitually without disturbing the host. Different psychological barriers differ in content of cognitive distortions. For example, a depression patient holds a negative attitude towards himself, the reality and future and bears prejudice that he is a loser contacting with frustrated things and a hopeless future. An anxiety patient, on the other hand, has biases against the threats in reality: over exaggeration of consequences, magnification of negatives and minimization of positives. Therefore, the key of cognitive therapy lies in correcting the distorted thinking of patients.

We took a seafaring student who was fearful of speaking English in public due to an incorrect understanding as an example. The teacher helped the student to identify his cognitive distortion.

(1) Enlightening the Student to Find His Cognitive Distortion

In the following dialogue, it can be seen how the consultant helped the student find his cognitive distortion.

S: I admire those who speak fluent English. I wish I could be one of them.

T: It's good to have such an idea.

S: But, I'm a little afraid.

T: Why?

S: I'm afraid of making mistakes in pronunciation. I don't think I can clearly express my ideas, since I don't have a large vocabulary.

T: Well, how about your English foundation?

S: I've passed the University Entrance Examination; nevertheless, I learned English only to get prepared for that examination.

T: Well, your English may be comparatively good.

S: But, after the exam, I've abandoned it!

T: So, what's your present problem?

S: I want to have a breakthrough and try to open my mouth to speak English, but I still feel fearful.

T: What's your fear?

S: I'm afraid of speaking incorrect English, being misunderstood by others, and affecting the progress of all classes.

(2) Holding a Discussion According to the Student's Cognitive Distortion

Now, the student's problem is clear. By identifying his cognitive distortion, the consultant lays a foundation for further counseling.

T: When you failed to express yourself correctly, did the others kick you out of the classroom?

S: No.

T: Did they bully you or call you names?
S: Neither.
T: Were you giving academic lectures?
S: No.
T: Were you hosting a meeting?
S: No.
T: Where did you sit?
S: Below the platform.
T: You alone?
S: No, there were many students.
T: The foreigner stared at you?
S: No, perhaps he never paid any attention to me.
T: Did he ask you any question?
S: No.
T: That's to say, the foreigner never noticed you?
S: Maybe. Perhaps I was thinking too much.

3.2 Group Counseling

In the psychological quality education of seafaring students, the author makes full use of the course to ask the students to write down on small cards the problems and confusions they have encountered in their study and life, and then discuss and analyze them under group counseling in class in order to enhance their psychological quality. Group Counseling is a form of consultation that offers psychological assistance and guidance on group basis. That is, counselees are divided into groups according to the similarity of their problems and jointly try to overcome psychological barriers and promote co-development of the members in the way of discussion, training and guidance. During a dozen group gatherings and activities, through exchanges of ideas with each other, discussing issues of common concern, interaction, mutual inspiration, support and encouragement, the group members understand themselves and others better. Accordingly, they will improve interpersonal relations, strengthen their social adaptation and advance personal growth.

Group Counseling provides appropriate context in which people can interact and communicate with others. It produces a series of social psychological phenomena such as interpersonal relations, suggestion, imitation, atmosphere, infection and social perception. Through this process of psychological interaction, the students can explore themselves and try to change distorted behaviors and learn new ones for the purpose of improving interpersonal relations and solving problems in life.

University Seafaring students are a special group with the same specialties, ages and problems. Group counseling helps them exchange their ideas, discuss problems that may be

encountered later and find out feasible solutions. In this way, their capacity of handling problems will be developed, which will effectively prevent tragedies or reduce the chance of psychological problems.

Meanwhile, group counseling enables the students to support each other and pull their wisdom to explore solutions to problems together, which reduces their dependence on the counselor. For example, a student's complaint about his being dumped by his girlfriend soon after they entered university would arouse other group member's sympathetic response. Through communicating with others, he learned that some other students had similar troubled situation, even more serious than his. He realized that he was not the most unlucky one, thus won consolation. Pouring out the students' frustrations releases their negative emotions repressed for a long time, reduces their psychological burden and stress, and stabilizes their emotions. Owing to their having similar problems, the group members feel it more urgent to solve them. They are active in exchanging the measures they have taken and the effects they have achieved, and more eager to make concerted efforts to discuss a way out. Such group work has achieved a noticed effect.

Group counseling, a method that reappraises and readjusts problems of interpersonal relations by putting them back into a similar situation, is well targeted and of practical effectiveness. Group counseling creates a situation similar to social life, and it's a copy of everyday behavior.

3.3 Individual Counseling

The author serves as a counselor at the Shanghai Maritime University Counseling Center. Through this platform, by making use of modern means of communication such as QQ, email, blog, cell phone, and website of mental health, etc., I have established a wide range of communication channels to get in touch with the students in need of help. I provide individual counseling for them, popularizing mental health concepts and knowledge and helping them to solve problems concerning their studies, love affairs, interpersonal relations and employment.

3.4 Practice Reinforcement

With the help of the alumni association, we took the students of seafaring specialties to visit China Ocean Shipping Company, Chinese-Polish Joint Stock Shipping Company and China Petroleum & Chemical Corporation, etc, and invited the managers of these shipping enterprises to provide pre-employment guidance for them. These activities helped the students know what kind of graduates the enterprises need, and provided opportunities for them to know the companies and the society better, acquire the latest seafaring information and abilities to be a social person. We also invited the outstanding graduates of seafaring students

to give them lectures on "career freshman". The senior seamen's specific lectures, particularly, brought to them the occupational sense of honor and strong self-confidence.

We invited the director of Shanghai Mental Health Center and Fudan University professors of psychology to give lectures on mental heath education, instructing the students to prevent and diagnose mental diseases. We also held activities, such as psychological knowledge contests, psychodrama contests, containing education in amusement, to upgrade the psychological quality of the seafaring students, and achieve the unity of knowing and doing, that is, to apply the theory they have learned in class to practice.

The author, a frequent instructor and judge of university debate contests, gives lectures on psychological education to each college. In practice, I continuously improve my teaching skills and accumulate my consulting experience to better educate the seafaring students in psychological quality.

3.5 Refining Teaching through Scientific Research

The author has taken part in some of the study items of the Department of Transportation, such as Marine Safety Control System, the Research on Professional Attitude and Culturing of the Seafaring Students. Through the scientific research, I have obtained a large amount of first-hand information about the seafaring students' ideological and political education and mental health. It provides resources for follow-up survey and further research.

4. Upgrading the Psychological Quality Education of the Seafaring Students

4.1 Helping Students Find Resources and Support

People liable to get into psychological or emotional difficulties are those who hardly use divergent thinking or find it hard to do so, making it difficult to solve problems and take effective action. It is beneficial for a counselor to help those people grasp methods to get out of mental predicament.

In the case mentioned in 2.1, the student is willing to change himself, trying to speak English in public by following the teacher's advice. He is aware of his problem, but doesn't know how to change step by step. At this point, the teacher should seize the opportunity to help him find a solution and have break-through in his thought and behavior. To achieve that, the teacher should help him have the feeling of success, gradually increase his confidence and improve his self-image. To be Specific, the teacher should identify and select a reasonable and practicable plan to achieve the set goals:

(1) Listing all obstacles: fear of making mistakes, being laughed at and re-experiencing failure; having no confidence to talk with foreigners; hardly imagining that he can speak cheerfully and humorously.

(2) Listing the support to actions: Having English certificates; having grasped enough commonly used words; willing to change; wide range of knowledge ; enough topics; unfashionable but graceful, making people feel secure in communication.

(3) Choosing the most decisive power: analyzing the obstacles and support

The author divided the students in groups to ask them to take role play in simulation of conflict debates, for example, disputes between a captain and a pilot because of ship speed or steering, port state customs examination disputes, high frequency calls misunderstanding, cargo damage or claim disputes, etc. In this way, the students' ability to use English in real situations has been improved.

4.2 Helping Students Construct Self-affirmation

In practice, students are easy to be trapped in a state of self-denial in that setbacks and challenges always coexist. Therefore, it is necessary to guide them to construct self-affirmation. It is essential to help them clear out all irrational beliefs that make them give up their plans: I can never learn it; my basic knowledge is too poor; I can never catch up with others no matter how hard I try; I will fail if I start to speak, and failure means self-destruction.

After they graduate and work on ships, the seafaring students will mainly communicate with sailors of other ships and staff on land such as maritime procurators, pilots, customs officers, marine surveyors, ship-owners, forwarders and so on. A survey shows that most sailors come from non-English speaking countries, including China, the Philippines, India, Greece, Japan, Pakistan, etc. Influenced by their mother tongue, their English levels are uneven. Some Chinese sailors say it is easier to communicate with sailors from English speaking countries than those from non-English speaking countries. Therefore, in study and communication, students should first learn to practice self-affirmation and self-motivation.

4.3 Helping Students Master Coping Skills

From plan to action, there is always some risk, which is often enlarged by the students who lack self-affirmation. Skill practice and role-play can help the students make up for this defect and acquire the skills such as how to greet foreigners, how to introduce oneself, etc. This can significantly reduce their anxiety and increase their positive expectations.

It is normal for seafaring students to have fear for the unknown working environment. To provide them with some feasible coping methods through research, analysis, and design is favorable to improve their communication effect. These methods include: acquiring necessary English language skills to fulfill the requirements of the seafaring job, focusing on listening and speaking practice with reading, writing and translating as a secondary priority.

For the seafaring students, they need to be more active in improving English, especially oral English. Specifically, they can make some plans such as: to recite Book Two of New Concept English which is specially designed for the students in non-English speaking countries and which well embodies the principle of gradual improvement; to read English newspapers and magazines extensively, e.g. The 21st Century, English Salon, Video and Audio English, etc., the rich and colorful contents are good materials for developing the students' ability to use language; to spend certain time in watching English movies in order to grasp correct pronunciation gradually, enhance language sense, develop comprehension, conjecture and inference ability , and eventually improve oral expression ability and build up confidence.

4.4 Helping Students Use Action Plan

It is vital for the seafaring students to correct their irrational beliefs. Action plan or homework is a direct and efficient method to reach the final purpose of students' self-instruction and independent growth.

With the promulgation and implementation of the STCW 78/95 convention by the International Maritime Organization and the 97 Regulations by the Chinese Maritime Bureau, the shipping industry has put forward higher requirement for the sailors' English ability, especially for listening and speaking ability. The sailors' ability to use special English, like professional expertise and skills, has become one of the professional requirements. In the shipping industry, it is a widely acknowledged fact that English is an important part of the sailors' seafaring life.

Besides subjective effort, objective environment is also very important for language learning. Shanghai Maritime University has enrolled foreign students of maritime schools from all over the world, including the United States, Australia, Poland, South Korea, Holland, Ghana, etc. The university inserted them in different classes with the Chinese seafaring students to form new classes. They had meals together, shared dormitories, and studied in the same classes. The close contact has enhanced their friendship. Most international students come from non-English speaking countries, so their English level is similar to that of the Chinese students. Mutual learning from each other has not only improved the seafaring students' oral English and the courage to speak the language, but also perfected their characters and world outlook.

5. Conclusion

Seafaring students account for one quarter of the total number of the students in Shanghai Maritime University, and its seafaring specialties are state-level characteristic ones. The seafaring students' psychological quality is an important indicator of their overall quality.

Conducting the psychological quality education of the seafaring students in the course form, the author has mastered a good control of the mood of the students and a skillful grasp of the topics. The counseling has been effective. As a result, the seafaring students ranked first in the overall quality assessment of SMU in 2009. And the author's course won the eleventh place in the Students' Evaluation of Teaching of Shanghai Maritime University in 2009.

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Yuping was born on October 20th, 1965 Shanghai. She graduated from Shanghai Normal University, majoring in educational management. She furthered her studies in psychology in Fudan University after she obtained her master's degree in the same University, majoring in law. She is a certified university psychological counselor. Her works include: I Want to Hold Your Hand published by Shanghai People's Publishing House in 2001 and The psychology Adjustment and Development of the Students of Seafaring Specialties published by Dalian Maritime University Press in 2008. In addition, her paper Comprehensive Quality Education for Future International Sailors won the third prize of Shanghai Teaching Achievement in 2010. Now she is a teacher in Shanghai Maritime University.

Piracy at Sea

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1. Introduction

Piracy at sea has got a very long history but in my paper I would like to concentrate on the developments in the past two decades.

Piracy and maritime terrorism have been on the rise since 1990 and have become a serious problem. On January 3rd 1990 ms "Boleslaw Krzywousty" , one of the Polish cargo vessels was attacked by Eritrean guerrillas about 59 miles from Massawa, some 6 miles from the coast of Eritrea at about 14.30 GMT.

The Polish vessel was approached by three armed boats and was fired upon.
The radio officer managed to send a Mayday message asking for immediate help and aircraft assistance.

The message was received by Bahrain Radio and some ships in the area but no assistance was given. The pirates used grenade launchers and the Polish vessel caught fire. The crew managed to lower the lifeboat but the guerrillas forced them to sail towards the coast of Eritrea. The Polish cargo vessel was burning all the time and became a wreck

The crew was kept hostage for over three weeks until the ransom was paid. Two of the crew were injured in the attack including the second Mate and the Master.
The Polish Ocean Lines have lost their cargo vessel. There exists a recording of the Mayday message which sounds very dramatic.

Since that time cases of maritime terrorism have become more frequent and in the year 2000 piracy at sea increased by 57% with Indonesian waters recording the highest number of terrorist attacks.
Pirate attacks are also frequent in the Gulf of Aden, which lies between Yemen and Somalia, off the Horn of Africa.

Between the years 2000 and 2006 the incidents of piracy rose by 68 % compared to the previous six years. The international community has been alarmed by the attacks on big tankers like the "Sirius Star" or the recent attack on the tanker "Moskovskij Univiersitiet" flying the Liberian flag as well as on smaller vessels sailing in the waters off the Horn of Africa and between Malaysia and Indonesia.

The European community has set up a naval force NAVFOR which escorts merchant vessels carrying humanitarian aid in the region and protects all vulnerable vessels in the Gulf of Aden and the Indian Ocean. Also many other countries like Russia, China, India and Japan,

among others, have sent their navy ships to protect the merchant vessels and their crews from being pirated in these waters.

Also NATO has joined the anti-piracy operations in the area around the Gulf of Aden, Erithrea and Somalia. The NATO group includes the following navy ships:
the Greek Navy frigate the "Themistocles", the Italian destroyer "Luigi Duran de la Penna"and the Royal Navy frigate HMS "Cumberland".

The NATO ships have been escorting vessels carrying humanitarian aid to the starving population of Somalia and also keeping an eye on the shipping routes in the area. The international community has also organized a multinational Combined Task Force which is trying to increase the safety of shipping in the Gulf of Oman, Gulf of Aden and in the Indian Ocean.

In May 2010 the Russian navy ship "Marshal Shaposhnikov" freed the pirated tanker and its twenty-three-member crew off the coast of Yemen.

At dawn, the navy ship sent special troops to the pirated tanker, after making sure that the crew was safe in a place on board, which was not accessible to the pirates. Special troops got on board the tanker from a helicopter and managed to capture ten pirates alive. One of the pirates was killed in the operation. All the crew members are alive and well.

A similar situation happened earlier to a Korean vessel which was helped by the US navy destroyer which happened to be in the area at the time. Below is the story and the tape script of the recording and a short video of the operation, which can be used in class plus some examples of exercises.

On October 29th 2007 the North Korean vessel "Taehongdan" was attacked by pirates in waters off Somalia, when it was anchored on roads, ready for departure after discharging its cargo at Mogadishu.

The ship came under a surprise attack by seven armed pirates disguised as guards. All the crew members were detained in the engine room and steering room.

"The US Navy says, when it was informed of the pirate attack, it immediately dispatched a helicopter from a ship about 90 km away. The Navy says, the pirates had taken control of the ship's command centre but the ship's crew remained in control of the engine room and steering controls.

As the US navy destroyer James E. Williams approached the North Korean ship in the Indian Ocean, north-east of Mogadishu, it contacted the pirates and ordered them to surrender. At about the same time, the navy says, the cargo ship's crew attacked and overpowered the pirates.

In response to a request by the crew, the US navy ship dispatched a boarding party and a medical team to care for several people who had been injured during the incident. Three of the crewmembers were so seriously injured that they had to be flown to the American ship for treatment. The navy could not provide the nationalities of the crewmembers or say what cargo the North Korean ship was carrying.

In all, the navy says, there were twenty-two crewmembers and seven pirates involved in the incident. It says two of the pirates were killed and five were injured and remained on the North Korean vessel".

How can we use such a video in class in order to make the students aware of the seriousness of the situation? Here are a number of exercises which the students can do in class.

2. Comprehension questions

1) What was the flag of the cargo vessel?
2) Where did the pirates attack the cargo vessel?
3) When was the cargo vessel attacked?
4) How did the US navy react when it was informed of the pirate attack?
5) Who contacted the pirates?
6) What were the pirates ordered to do?
7) How did the crew of the cargo vessel behave?
8) What assistance did the crew require?
9) Why did the crew require medical care?
10) How many crewmembers were on board?
11) How many pirates attacked the cargo ship?
12) What happened to the injured crewmen?
13) What cargo was the vessel carrying?
14) How many pirates survived?
15) What happened to them?
16) How many pirates were killed?

3. Decide if the following statements are true or false

	T	F
The North Korean vessel was on roads ready for departure		
The US navy ship did not help the cargo vessel		
The North Korean crewmembers were very brave		
The waterways near Somalia are quite safe		
Helicopter assistance is very important in combating piracy		
Piracy attacks are now not so dangerous as before		
There were twenty crew members on board		
Seven pirates attacked the North Korean vessel		
The crew assembled in the engine room		
The US navy destroyer did not tell the pirates to surrender		

The ship's crew overpowered the pirates		
The US navy did not send a boarding party and a medical team		
Five of the pirates were killed		

4. Mark the right pronunciation of the verbs with –ed endings -t -d -id

The North Korean vessel was attacked by the Somali pirates			
The pirates were disguised as guards			
The US navy was informed of the pirate attack on the 29th October			
They dispatched a helicopter from a ship about 90 km away			
The crew remained in control of the engine room			
The US navy destroyer approached the North Korean ship			
It contacted the pirates on board the North Korean ship.			
It ordered them to surrender			
The ship's crew attacked the pirates and overpowered them			
Several people had been injured during the incident			
The US navy provided medical help to the seriously injured			
Seven pirates were involved in the incident			
Two pirates were killed and five remained on the North Korean vessel			
The seriously wounded were treated on board the American ship			

5. Put in the right prepositions

1) The North Korean vessel was attacked ….. November 2007.
2) The US navy was informed ….the attack …. the 29th October.
3) The pirated vessel was approached ….. the US navy destroyer.
4) It contacted the pirates …. board the North Korean ship.
5) The US navy sent a helicopter ….. a ship ….. 90 miles away.
6) Some people were injured ….. the incident.
7) Five pirates remained …. the North Korean vessel.
8) The injured people had to be taken …. the American ship …. treatment.
9) The crew remained …. control …the engine room.
10) The waters ….. the Somali coast are dangerous.
11) The vessels should be protected ….. pirate attacks.
12) Helicopters are very useful ….freeing operations.

6. Talking points

a. Talk about the recent cases of piracy you have heard of or read about.
b. Discuss the possible results of piracy.
c. Mention the practical ways of combating piracy at sea.
d. Say something about the possible reasons for piracy in the Indian Ocean.
e. Describe your own experience of piracy, if any.
f. What would you do if were a passenger on board a pirated vessel?

To conclude, these are just some of the suggested exercises which we can do in class. Nowadays, teaching English at maritime universities and academies involves not only making the future seamen aware of the cross-cultural issues but also preparing them for the problems which they may come across during their work on board.

Seaman Stress Management onboard Ship

Abstract

Based on questionnaire research to Chinese seafarers the severity of stress problem is recovered by this paper. After further interviewing, the stressors of seafarers and the effect of stress to the safety of ship are discussed as well as some suggestions for stress management on board are bring forward.

Keywords: Stress, seafarer, stress management

1. Introduction

On 14h February 2007, a second officer committed suicide on the crude oil tanker Desh Shanti. The reason for his pathetic activity reported by related authority is that he suffered too much stress due to long time working on an isolated environment (Fairplay, 20 Feb, 2007). It is not until 2009 for me to realize the serious situation of stress problem in our Chinese seamen when my colleague and I did a questionnaire research to 100 seafarers working on international trading ships, and the result shows that more than 65% of them deem they always work under high stress including 35% of them consider their stress is excessively high.

What is stress? How can stress become a problem of safety of life at sea? According to a high school psychology textbook, stress is "a particular pattern of disturbing psychological and physiological reactions that occur when an environment event threatens important motives and taxes ones ability to cope."“ Stress is a feeling that's created when we react to particular events. It's the body's way of rising to a challenge and preparing to meet a tough situation with focus, strength, stamina, and heightened alertness”（MedicineNet,2009） Actually, we can find a variety of definitions for stress, and more or less talking about a response of human to the outside environment, which can be either positive or negative. Therefore, it is valuable to discuss the stress problem of seaman in the maritime context, try to find out the sources of stress on board and their relation to safety, as well as counter measures in order to enhance the safety of life at sea.

2. The stressors of seafarers

The events which may provoke stress to human are called stressor. Everything from the outside could be a stressor for a people and the things cause you stress may not be a problem

for your neighbors (Fang, 2006). Since most of the investigated seafarers regard their job as a high stress one, finding out the most common stressors onboard ship should the first step of our research. We selected 20 seafarers of different rank and experience for interviewing and based on this interviewing the stressor of seamen are reported and discussed as follows:

2.1 Risk and stress

Nearly all the interviewers agree that navigation is still a high risk job, and the high risk environment will cause stress to them. Although technologies developed a lot in the past decades, a lot of accidents did happen every year. Today, most of the safety trainings are focus on the real accident study and analysis, which is easy to give seafarers an impression that working on board ship is much more danger compared with many other jobs. Of course it is good to give seafarers a conscious of risk in order to guide their behaviors during watch, but obviously exaggerated or magnified risk awareness will become a burden of people.

2.2 Responsibility and stress

The responsibility can put pressure on seafarers. Today, the value of each ship is remarkable the cargo she carries maybe more costly, and the invaluable things she carries is the life of people. However, lives and properties may be lost due to a small mistake during the watch keeping of a seaman. As a result, watch keeping onboard is expected to be very careful and accountable. In this case, senior officer and inexperienced officer may feel more stress than other crew member because the former has more responsibility and the later lack of ability.

2.3 physical environment and stress

The working environment onboard may also give stress to seafarers. As we know, seaman is a group of people living in a small isolated world, suffering noise, vibration and rolling. Most of them have to work on shift schedule, do the same works again and again, can not get fresh vegetables and nutrition balanced food. These are all factors to make people feel be pressured (AMSA, 1997).

2.4 Lack of family life and stress

The long time apart from their family make seafarers anxious. Due to the shortage of international seagoing seafarers, it is normal for them to service 8 months on board ships, some even work more than one year. As we know the family life is a good medicine to

mitigate the stress in our work, and those negative impacts of apart from home such as homesick and anxiety will increase the degree of stress to seafarers.

3. The effect of stress

The effect of stress is not always bad – sometimes we need stress to mobilize our energy and concentrate our minds. Nixon P in 1979 has discussed the relation between people's performance and stress as shown in figure 1 (Hanish, 2007). People need certain stress to perform best in their work. Insufficient stress will impair people's performance due to distraction, whereas excessive stress could lead to exhaustion and burn out. Moreover, excessive stress can cause problems such as physical illnesses, absenteeism, increased interpersonal conflicts (Neil A, 2008), these problems may jeopardise the safety of ship.

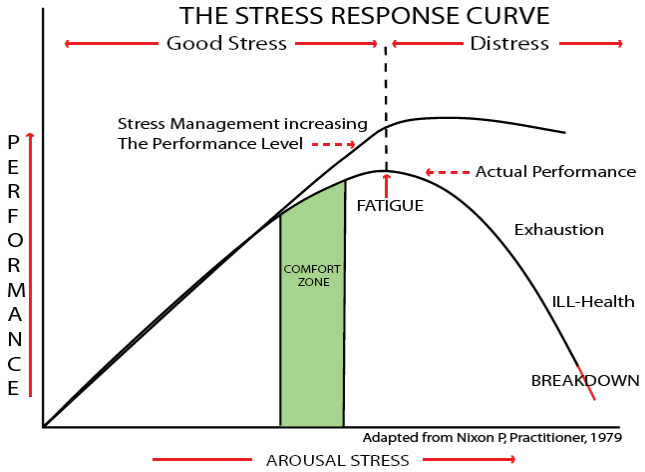

Figure 10. Stress and performance

Canadian Mental Health Association(2010) agreed that the stress response of a human can be divide into three stages, the first stage is called "Mobilizing Energy", when the body will releases adrenaline, breathing will be more quickly and heart will beat faster. People may concentrate them and perform best in this stage. If the stress is still there after a certain period of time, the stress response will goes to the second stage -"Consuming Energy Stores" when body begins to release stored sugars and fats from its resources. At this stage, people will feel driven, pressured and tired. they may drink more coffee, smoke more, and drink more alcohol than is good for health. Anxiety, memory loss, catch colds or other health problem will easy to occur. If people can not manage to escape from this stage, the situation may goes to the third stage "Draining Energy Stores", the body's need for energy will become greater than its ability to produce it, and people will become chronically stressed. People may suffer insomnia and develop a serious sickness such as heart disease, ulcers or mental illness. At the same time they may make mistakes in judgment and change their personality. As we know that

navigation is a team work, these problems will surely impair the safety of ship. Therefore, the effective stress management should be carried out onboard ship.

4. Measures of stress management onboard ship

First, more attention should be paid to seafarers' stress management. Although it is recognized that in the maritime field human factor have contributed more than 80% of the accidents in the past, and as discussed above, stress is one of the factors which will effect the performance seafarers, no concrete regulations regarding seamen's stress problems have been built currently. Since stress management is not required by law, it is hard to say that companies have paid enough attention on this issue. Therefore, it is expected that stress issues can be put on the agenda of administrations and international organizations, and related regulations will come out as soon as possible. To this end, Stress management can be a routine content of ship management.

Second, Training to seafarers regarding stress management and related knowledge should be carried out. In the current seafarer's training curriculum, stress and related psychological knowledge is not included. Many seafarers do not know much about the harm of chronic and excessive stress as well as how to deal with them. Just like first aid and fire fighting, basic cognition of stress should be required to all the seafarers, so they can tackle some stress problems by themselves. Moreover, seamen of management level should be trained for basic psychological assistance, which will increase the feasibility of stress management on board.

Third, stress evaluation models should be used for seafarers. To be more aware of the stress level the crew suffered, some special tools should be used for stress assessment. For example, Ergonomic Stress Level (ESL) measure, which is an instrument designed to calculate body motion and posture, physical effort, active hazards and environmental stressors in the workplace, and can be used to predict the occurrence of occupational injuries (Luz, Melamed, Najenson, Bar, & Green, 1990). With this tool, the stress level of crew can be assessed and proactive measures such as furlough and psychological assistance can be used to avoid the accidents due to stress.

Fourth, More colorful and comfortable living and working condition should be supplied to seafarers. As discussed before, the poor living and working condition are one of the stressors of seafarers. According to a survey by Omdal (Omdal, 2003) of 11 Norwegian vessels in order to identify factors potentially harmful to health, 44% of respondents reported that noise is a problem. In contrast, only 8% of seafarer onboard noise-reduced vessels reported stress. As Andy (Andy, 2006) stated "Such evidence suggests that through technology and improved design some traditional hardships associated with the maritime life can be overcome".

Fifth, shorter or limited service period should be a principle for seafarers. According to an occupation investigation of SMU in 2005, only about one third of the graduates of navigation department are still working on board ship five years after graduation, the main reason for them giving up sea going career is that they can not take care of their families after marriage due to long time work outside. This is also a common phenomenon in the world, which aggravated the shortage of seaman labor force. However, if each service period can be reduced to one or two months and there is a regulation to limit the maximum service period, I think the contradiction between family and sea going career will be much relieved. More labor force will be available as well as the stress due to long time working will be reduced.

5. Conclusion

Seafarers suffer high stress during their work, which may potentially harm to navigation safety. The sources of stress onboard include the high risk, heavy responsibility, poor working and living environment and long time working period on board. However, if stress management can be a implemented, training and stress assessment tools can be adopted, living and working condition can be improved and the service period be reduced, the stress problem will not be a tough enemy to navigation safety.

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International Student Collaboration on Culture and Communication

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Abstract

Intercultural communication and its many issues regarding clarity, efficiency, cooperation and safety is always a recurring theme that needs to be addressed in MET institutions and practices worldwide. Research and investigations have shown the importance of to-the-point communication as well as awareness and understanding of what intercultural communication really is.

Even though "low risk" communication as well as time critical communication in an international and multilingual setting is seen as important, there are few student learning activities that promote any first-hand experiences and chances to develop any real understanding of situated communication in an international setting.

Therefore, this workshop discussion aims at investigating ways of promoting and facilitating international and cross-cultural student collaboration on issues related to communication in the context of international seafaring. Areas that will be particularly addressed in the workshop discussion are types of situations, scenarios and contexts that lend themselves useful as learning activities. The other focus is on the actual means for, and setup of, this type of international student centred collaboration in terms of affordable and ubiquitous technology, as well as structures for supporting and maintaining such an international collaborative endeavour.

It is important to stress that this session does not aim to explore and look at all facets of intercultural communication at sea, but that it is instead intended as a discussion of ways of promoting activities and structures for teaching and learning communicative competence and understanding in an international setting and through international collaboration.

1. Introduction

Nobody can dispute the importance of clear communication onboard vessels at sea and in ports. Whether it has to do with internal (onboard) communication or messages shared between other vessels and land stations, preciseness and unambiguous vocabulary and

language usage may be a matter of pure survival. Yet, achieving this clarity and unity in communication is quite a different thing.

Onboard vessels we are very often facing both multilingual and multicultural settings with crewmembers from different countries and backgrounds. These crews are then also dealing with third parties such as other vessels, VTS stations, and pilots, again with yet other linguistic and cultural backgrounds. All of this provides situations where communication is put to its test. This is true both for everyday social situations as well as time-critical decisions made on the bridge, in the engine control room, or on deck.

Therefore it seems fair to say that dealing with these issues is not only interesting and important; it is, in fact, vital. Fortunately, this is also precisely what happens all over the world in various forms at educational institutions engaged in the training of future seafarers. Obviously, these activities vary from general English courses, Maritime English initiatives and classes on intercultural communication, to seminars and more hands-on experiences (such as e.g. the exchange initiative by Naoyuki Takagi at TUMSAT in Tokyo).

This workshop discussion aims at finding an affordable and sustainable complement to these other activities. It should therefore not be seen as an attempt at finding an alternative to the teaching and learning activities we see today, but as an inquiry to additional student-centred learning activities in order to provide first hand and hands-on experiences of intercultural communication.

By providing a platform for this type of collaboration, it is my hope that we can create greater awareness of the various communication situations our students will encounter; what the communicative purpose is and what limitations and consequences communication may have in low and high stakes situations at sea and onboard vessels.

Even though English is the lingua franca, the purpose of this type of collaboration is also to see beyond purely linguistic features of communication and that it is not only a matter of learning and using "English", but that it is also about gaining intercultural communicative competence (ICC) and understanding of communication in a broader sense.

Doubtlessly, it is important to probe the words "culture" and "intercultural" and what they mean (or at least what they encompass). However, at this stage I will settle for a rather wide and inclusive interpretation, broadly sketched in the list below (note that this is by no means a comprehensive list).

- Language
- Age
- Context and situation
- Education
- Knowledge
- Socialization and experience
- Status

As can be seen here, these items include both more personal traits as well as clearly interpersonal or extrapersonal factors. However, they all have functions within organizational systems such as home, school, workplace, and society.

At a surface level, we may be prone to think that, for instance, a certain education and educational level would easily correspond internationally. As this certainly is true in some senses, it is probably more complex than that, as the "same" education varies, not necessarily regarding standards, but in relation to the immediate context, social structures and intrinsic organizational and historical factors at that particular institution. In this sense, it is clear that the notion of "cultural differences" is not just a matter of global perspective, but something that is true even for subunits at one department.

2. Communication at sea

There are many examples of communication at sea, whether it has to do with purely social interaction onboard a vessel or critical situations where communication plays a pivotal role in the safety of life at sea. So, by looking at some of these situations, this workshop aims at finding relevant scenarios where communication may be an issue. Such situations most certainly include onboard communication (everyday situations, planning, orders, negotiations etc.) and external communication (requests, information, questions, intentions, emergencies etc.)

Onboard a vessel with its inherent structures and functions, a theme such as decision-making is an important focal point of the role of communication and the need for mutual understanding and negotiation of reality. Here the concept of sensemaking (Weick 1995) works well as an explanatory and analytical tool for the communication strategies that need to be deployed in the many and varied situations at sea.

Being able to "make sense" of a situation is obviously paramount when dealing with such high stakes as are involved in seafaring. It is also important to realize that this understanding of a situation is embedded in the actual speech acts and communicative sequences and that the negotiation of reality may be seen as an interactive process between speakers. It should therefore be clear that the dimensions of intercultural communication and its possible problems must be mitigated in order to ensure a safe passage.

3. Learning and understanding communication

Intercultural communicative competence is a vast area to deal with and devising means and structures for teaching and learning ICC is a great endeavour. As intercultural understanding often is complex and multifaceted, it is important to realize that gaining this communicative competence is not an obvious and automatic process. Therefore, the learning

experiences of intercultural communication must be pedagogically well grounded, allowing reflection and analysis (Byram et al. 2001).

In order to bridge the gap between (or at least taking the ferry across) theories of intercultural communication taught in the classrooms and the later, real experiences as a seafarer, it would seem appropriate to scaffold a more hands-on environment where the stakes are low and the potential for reflection and learning are high. By providing a collaborative platform where students from different language and cultural backgrounds can actively engage in intercultural communication situations relevant to their future profession, it is my belief that we can encourage students' understanding of communication issues in terms of greater awareness of others' communicative competence, and, perhaps more important, awareness of their own communicative competence in an international setting.

4. Background theories

As this workshop will focus on the very first steps of establishing an international student-centred learning environment, no attempts will be made to providing an overview of the plethora of research and theoretical frameworks that constitutes the field of intercultural communication. However, it is still important to acknowledge the diversity within the discipline and that it is truly a multidisciplinary field of study that encompass, among others, linguistics, sociology, anthropology, and psychology. In this particular case of attempting to create intercultural communication learning activities, also pedagogy becomes an obvious cornerstone.

A fair starting point, however, would probably be to define what intercultural communication consists of. Obviously, there are many definitions and levels of definitions to a field as broad and intricate as this, but Kim's (1984:16) description of it as something that takes place when speakers with different cultural backgrounds, directly or indirectly come into contact with each other, works well as an encompassing frame.

Of course, how we construct meaning, how we negotiate meaning (together), and what "filters" there are to understanding/using a certain message (or prompt) are intrinsic questions regarding communication and therefore equally valid as concepts when dealing with intercultural communication. Here, the concepts of constructivism in terms of cognitive complexity and cognitive differentiation, as well as expressive, conversational and rhetorical logic (Littlejohn 1999) can serve as explaining models.

Relational communication where the focus on communication is more on how people accomplish things together (Littlejohn 1999:315) would seem a valid basis for the investigation and understanding of intercultural communication at sea. As mentioned earlier, the term sensemaking (Weick 1995) is a central concept here and the distinction Weick makes between interpretation and sensemaking: "Most descriptions of interpretation focus on some

kind of text. What sensemaking does is address how the text is constructed as well as how it is read. Sensemaking is about authoring as well as reading" (1995:7).

So, even if sensemaking or understanding can take place in solitude within individuals, most often sensemaking is referred to as a collaborative and reciprocal phenomenon and process within an organizational structure. It is also here that the challenge of communication lies.

As an example of this challenge we can take a situation that, if studied on your own, may seem perfectly clear an unambiguous (to you). However, someone else may understand the same situation differently. If, then, it is important that both parties should share a joint picture of the situation, communication is used in order to mitigate the differences in understanding (or lack of understanding). This is the straightforward way of looking at communication, but it is equally important to stress the fact that it is not only "transmitting" information that builds understanding, but that understanding is a communicative process in itself; communication as a means for negotiating reality.

Other aspects that are true for communication "in general" may become even more prominent and influential when dealing with intercultural communication. Here, stress and the overload that causes cognitive regression as more processing capacity is needed which means that other cues (however important) may be lost (e.g. Mandler 1982, Weick 1990) are factors that must be taken into consideration as they not only fit into intercultural communication, but very much because they are also typical for many (stressful) situations onboard a vessel.

As a framework for intercultural learning and a basis for the components of this collaborative project, Miller's (2009) claims of the necessity of expanding the realm of intercultural communication teaching/learning to include real experiences will be of focal interest. Moreover, important in any scaffolded learning situations is that it is based on activity and that these activities and their learning outcomes are aligned. That is, that objectives, activities, assessment and outcomes are constructively aligned (Biggs and Tang 2007).

The main ideas regarding the learning outcomes for a collaborative student-centred project like this are based on four interconnected constituents for developing intercultural communicative competence. These constituents are cultural knowledge, cultural skills, cultural attitude, and cultural awareness (Miller 2009).

5. Purpose

This workshop discussion is a first step in establishing a collaborative structure that will provide an active learning environment regarding intercultural communication issues for students around the world.

There are three combined aims for this workshop and the first is to investigate ways of promoting active learning of intercultural communication by looking at what types of

pedagogy, materials, situations and scenarios that can be used as setup for communication themes.

The second aim is to look at distance learning technology; information and communication technology (ICT) that can facilitate synchronous or asynchronous communication between students and also provide materials and cues for the learning situations. Important factors here are those of affordability and accessibility.

Another important purpose is obviously also to start a network of interested participants who are willing to collaborate and test setups, materials and technology at the initial phase of this international project.

6. Intended outcomes of the workshop

The workshop must be seen only as a first step of a much longer journey and therefore the outcomes of the workshop should be seen in that light. However, as a minimum, an inventory of needs should be carried out where we will be able to see possible similarities and differences necessary to address in any further collaboration.

A second outcome is the preliminary inventory of means. That is, what ways and structures there are for promoting this kind of student-centred international collaboration in terms of IT infrastructure, institutional structures, and student/teacher engagement.

A third outcome component is a brief inventory of materials, situations and pedagogical/didactical approaches that can be used for this type of international project.

7. Conclusion

The aim of the workshop is to look at the possibilities of setting up an international, student-centred learning activity that promotes intercultural communicative competence (ICC). This project is intended to scaffold existing "intercultural communication courses" by providing hands-on experiences and understanding.

Apart from the obvious and main objective of being a student-centred learning activity, it can also (in the longer run) provide a valid and interesting research arena for further development and understanding of the particular circumstances of intercultural communication in specific situations, and how this can be taught and learnt.

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Author biography

Carl Johan Carlsson is the director of studies at the Centre for Language and Communication, Chalmers University of Technology, where he is engaged in developing and teaching integrated communication and language courses within various disciplines. Since 2001 he has also been involved in teaching safety communication classes for navigational cadets as well as other English for Specific Purposes (ESP) courses. He is also the director of Chalmers' writing centre; Chalmers Open Communication Studio.

Cadets Views on Undergoing Maritime Education and Training in English

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Abstract

Several studies clearly indicate that most accidents at sea are related to human errors many of which are due to communication difficulties and are most frequently based on lack of appropriate knowledge of the English language. This language barrier is most common amongst multinational crews and port authorities, particularly in restricted waters. The correct use of English in the global maritime profession is considered crucial to avoid incidents at sea and to facilitate a more effective means of communication between ships and ship and port as well as to harmonise management and operations onboard vessels with multi-national crew. The number of ships with multi-national crew is rapidly increasing and this trend is expected to amplify in the future.

Turkey has a considerable maritime history and a large and well-educated population of young people who would be willing to serve at sea. These factors make Turkey, in particular, a valuable potential source of large numbers of seagoing personnel of different types and levels of seniority, which would considerably enhance manning on a worldwide scale. However, Turkey has no great history of adherence to English as anything other than a minor school subject: this means that few young Turkish people currently recognise that good English language skills can create employment opportunities world-wide in a wide range of sectors, particularly as seafarers in the maritime industry.

In 2003, the Turkish Maritime Education Foundation (TUDEV) initiated a programme to conduct maritime education and training (MET) in English alone. To achieve this required coordination and cooperation with many other maritime education establishments as well as awarding and accreditation authorities abroad. This resulted in TUDEV becoming heavily involved in several EU-funded projects based on the development of maritime English language training (SOS and MarTEL) and other related topics such as maritime safety (TRAIN 4Cs I and II, MAIDER and EGMDSS) and automation and risk assessment/management (SURPASS).

This paper reports on an evaluation of TUDEV's new programme by its own cadets who have undergone their MET programme in English. Their views on a wide range of aspects

of the MET were collected. The results were analysed which has helped TUDEV to refine its teaching and learning model. It is anticipated that MET institutions who wish to deliver their programme in English could benefit from TUDEV's findings.

Keywords: Maritime Education and Training, Maritime Safety, Maritime English

1. Introduction

The English language requirement for an Unlimited Officer of the Watch is defined as 'Adequate knowledge of the English language to enable the officer to use charts and other nautical publications, to understand meteorological information and messages concerning ship safety and operation, to communicate with other ships and coast stations and to perform the officer's duties also with a multilingual crew, including the ability to use and understand the Standard Marine Navigational Vocabulary as replaced by IMO Standard Marine Communication Phrases' in STCW 78 (95). It is evident that an unlimited Officer of Watch should have a good command of the English language to meet the above mentioned requirement.

It is also evident that most accidents at sea are related to human errors, mainly because of communication difficulties (UK P&I Report 2007, Ziarati, 2006). This problem most frequently is the result of a lack of knowledge in the proper use of the English language and maritime terminologies. There is a language barrier between multinational crew aboard different flag ships and the ports they frequent in their normal trade while sharing amongst them the same restricted waters. The use of the English language in the global maritime profession has and is crucial in avoiding accidents/incidents at sea, as well as in harmonising management and operations of ships sailing with multi-lingual crew (Loginovsky, 2002).

To overcome the seafaring officers language problem, two decades ago Turkey established a one-year English language preparatory programme, similar to many other non-native English speaking countries, considering the importance of teaching English in the context of Maritime English (Loginovsky, 2002) by delivering the seafaring officer's education and training in English itself. Unfortunately, due to a shortage of qualified maritime lecturers who are able to teach the MET main units in English, the programme did not succeed as planned at the time. Learning from this experience led TUDEV through international collaborations and with support from the EU TUDEV reconsidered the delivering of its programmes for deck officers and marine engineering officers in English.

In 2003, after extensive studies, the Management Board of TUDEV decided to re-initiate the earlier plan and introduce a one-year English programme and review it's MET for deck and marine engineering officers and deliver them in English. All students through careful planning were also introduced to Maritime Turkish and some of the safety elements were also delivered in Turkish. Students who were deemed to have not reached the required level of

competency in English after the one-year English preparation programme or did not wish to study their programme in English were grouped into Turkish cohorts where most of the main units were delivered in Turkish with exposure to English maritime terminologies.

2. The Maritime Education and Training in English Alone

BTEC (Business and Technology Education Council) HND (Higher National Diploma) programmes which are run in many countries worldwide were selected to be applied in TUDEV Institute of Maritime Studies. To ensure the quality of the system, an agreement has been established with EDEXCEL and SQA (Scottish Qualification Authority) concerning the delivery of both the academic programmes (HNDs) and vocational qualifications (NVQ and SVQ through partner colleges in the UK). TUDEV has also established cooperation with some well-known universities and colleges in the United Kingdom, Norway, Finland, Poland, Holland and several others.

In October 2003, the new system was launched for a core group of 22 deck students. In 2004, a second group started in the same programme as well as the HND and NVQ for Marine Engineering cadets. In 2005, the MET system offered by the Institute has been modified to include a full-range of English HND programmes and an agreement with Plymouth University offering an opportunity for TUDEV graduates to enrol on the final year of the Plymouth University's BSC (Hons) in Nautical Science (Commercial Shipping) Programme.

The main problem encountered was finding qualified lecturers to teach the main underpinning knowledge units (HND Units) in English and applying the sea training vocational units by expecting the cadets with support from their placement vessels to implement these units in English language. In order to overcome the problem of a shortage of maritime lecturers with good English language skills, several former navy officers with remarkable sea experience and good teaching skills in the English language who previously taught in Naval Schools were recruited. Additionally, some lecturers from UK and Canada MET Institutions were invited to join the teaching and research teams to support the programmes. This provided a good blend of different cultures which is the natural environment of the maritime world.

In parallel a study was initiated to improve the repository of books and equipment and was duly completed albeit at a considerable cost. Furthermore, ARPA Radar, Bridge and GMDSS simulators were upgraded; and, a brand new Bridge and later an integrated Engine simulator were added to the physical resources.

In 2005, TUDEV initiated SOS (Safety on Sea), a European Union Leonardo Project concerning improvements in MET and development of several new laboratories as well as a re-vamp of the workshop and the maintenance workshop to ensure that they are in line and of the same standards as those in leading MET institutions in Europe. This project was

supported by a 'mobility project (TRAIN 4Cs)' to prepare TUDEV's graduates for UK MCA examinations for a second certificate of competency. Consequently, TUDEV has become increasingly involved in several EU funded Projects that include: development of Maritime English Language (MarTEL), Maritime Safety (M'AIDER) and Risk Assessment/Management (SURPASS). TUDEV has also been invited to the join the European Boat Design Innovation Group (EBDIG).

The English language preparation programme is a key requirement but it is not sufficient to follow the vocational programmes' requirements for which, additional language training measures have been instituted comprising higher learning skills - reading, writing, listening and speaking skills.

In 2007, an EU project called Maritime English Language (MarTEL) Training programme commenced at TUDEV. The purpose of this project was to define the contents of the Maritime English language courses and structure them to measure/assess the Maritime English language competency of seafarers at different levels. The results, of which could be used worldwide to evaluate Maritime English skills of seafarers in light of the STCW requirements, were found quite satisfactory.

At TUDEV there was some resistance from some of the students who demonstrated weakness in learning the English language to the level required for the main programmes. They complained that they were unable to follow the main courses delivered by foreign visiting lecturers because of the subjects being taught fully in English. To solve this problem, some Turkish lecturers were assigned to support the vocational units in need of being taught and/or explained as the need arose in the Turkish language. In this regard, a proposal to transfer a group of students, who demonstrated a weakness in the English language into the Turkish programmes received strong objection and were to some degree refused in order to protect the strength and integrity of the system, since the English language is the recognised and accepted language of seafarers world-wide. Grouping the cadets into different cohorts and adding additional support to explain the core units also in Turkish solved most of the problems encountered.

However, to improve and remedy the foregoing situation more effectively, additional course hours were added in teaching some of the main units in the Turkish language to students who earlier demonstrated weakness in understanding the subjects in the English language.

Another problem was the accreditation of the HND and NVQ (and SVQs) programmes, due to differences between BTEC and Turkish assessment procedures. The latter uses a 'percentage' system of marking, which is based on a candidate's overall knowledge of a subject and, the former is a criterion referencing system based on the fulfilment of each outcome of the unit and a set of assessment criteria which are all expected to be satisfied if a Pass Grade is to be awarded. In this regard, the adaptation of the new requirements in grading the examination papers by our lecturers was understandably difficult.

Despite the foregoing set-backs, TUDEV has witnessed good success in the delivery of its overall MET programmes. The success was confirmed by evaluating the results of our graduates who took the Seafarers Examination. The reports in the Sea Training portfolios documented 'customer satisfaction' has been substantially increasing, which was apparent by the number of requests from shipping companies for our students for employment as well as for sea training aboard their ships. The percentage of scholarships provided by companies has also increased significantly compared to previous years.

3. Student survey

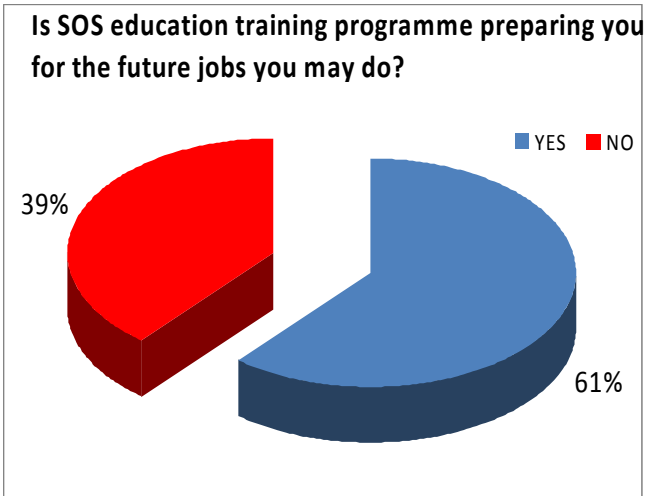
3.1 Nomenclature

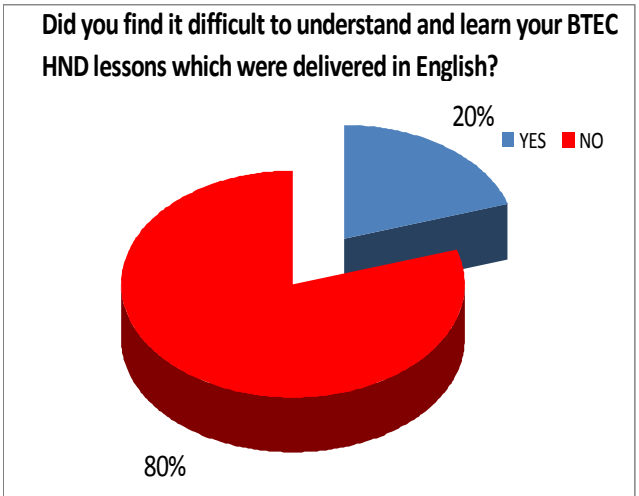
BTEC– Business and Technology Education Council
HND – Higher National Diploma
NVQ – National Vocational Qualification
SVQ – Scottish Vocational Qualification
BTM – Bridge Team Management
SH – Ship Handling
EDH – Efficient Deckhand
SOS – EU funded 'Safety On Sea' project which combined BTEC HND, NVQ/SVQ, BTM, SH and EDH together with IMO safety courses such as Fire Fighting and so forth. SOS MET Programme developments were led by TUDEV with support from several partners in Europe. For more information about the partnership please see www.maredu.co.uk or www.c4ff.co.uk.

A survey was conducted to verify the advantages and disadvantages of the effects of TUDEV's SOS project particularly one of its main component BTEC HND system on the cadets.

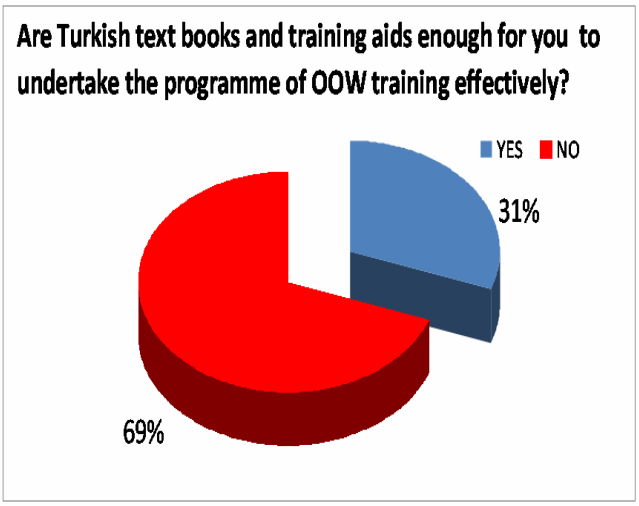
Total 30 questions were presented to the final year cadets who had both negative and positive implications. The results have also been analytically evaluated by using SPSS 17.0 programme and all of the results were found in acceptable criteria.

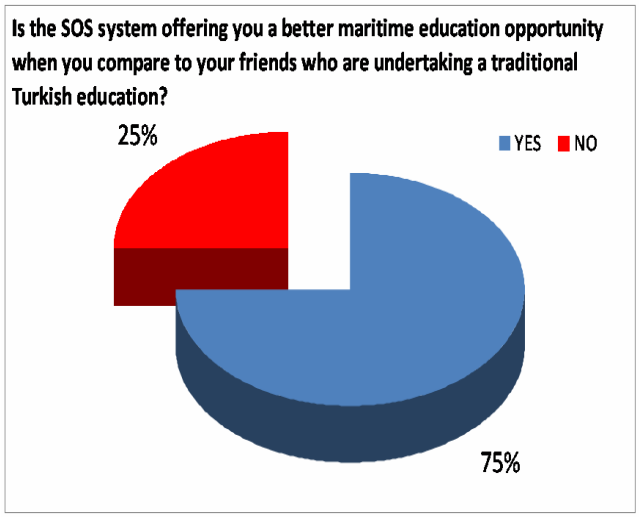
3.2 The questions and responses are as follows

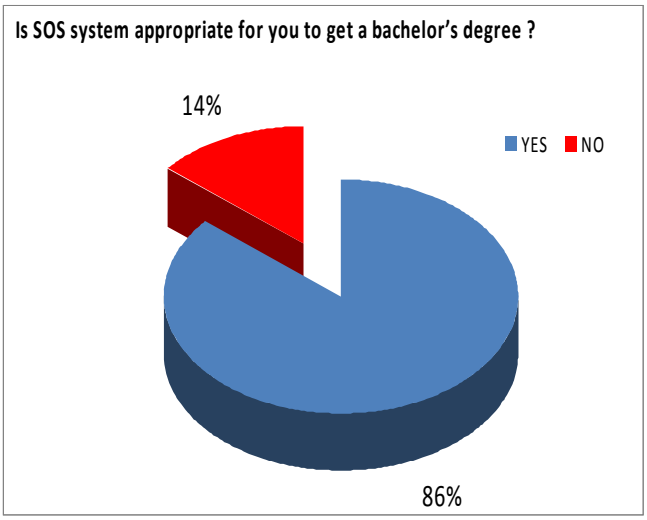


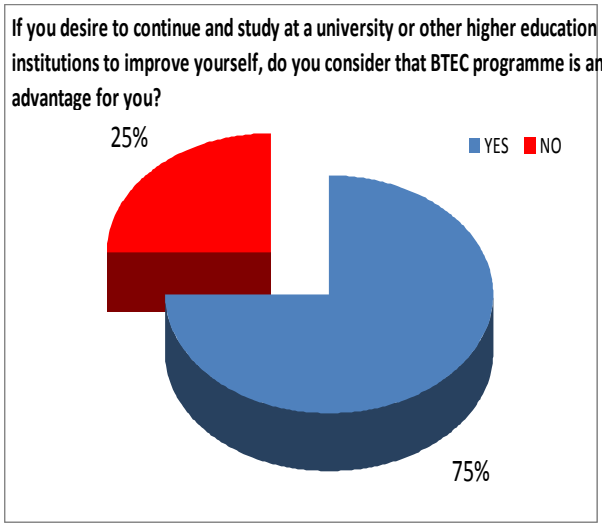


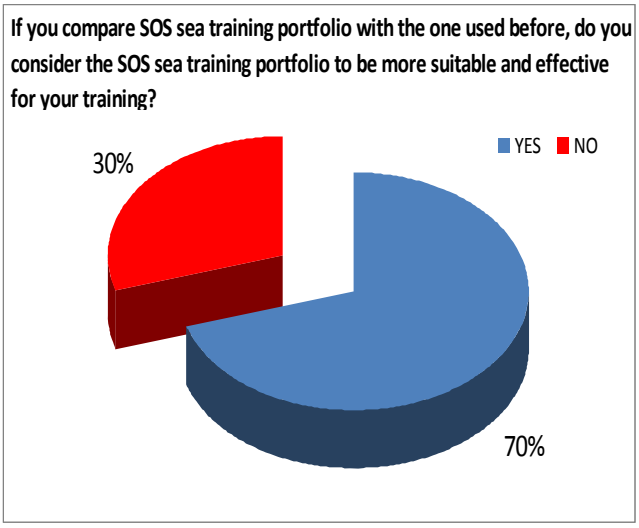

Can you find Turkish text books and training aids at stores for the programme of OOW training?
YES
NO
39%
61%

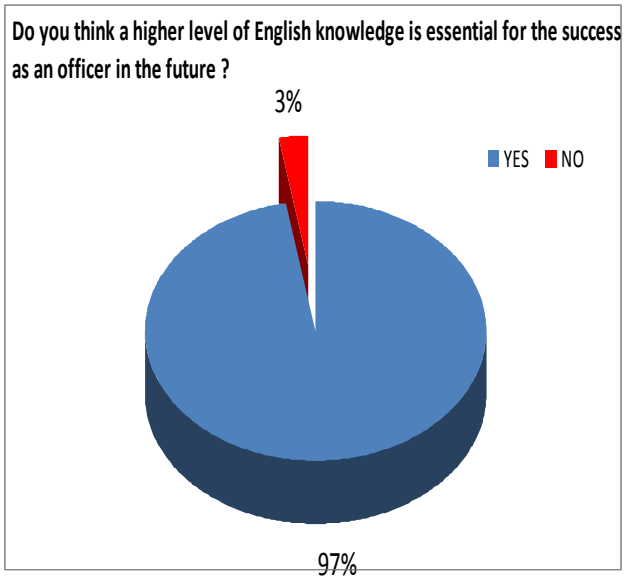

Are Turkish text books and training aids enough for you to undertake the programme of OOW training effectively?
YES
NO
31%
69%

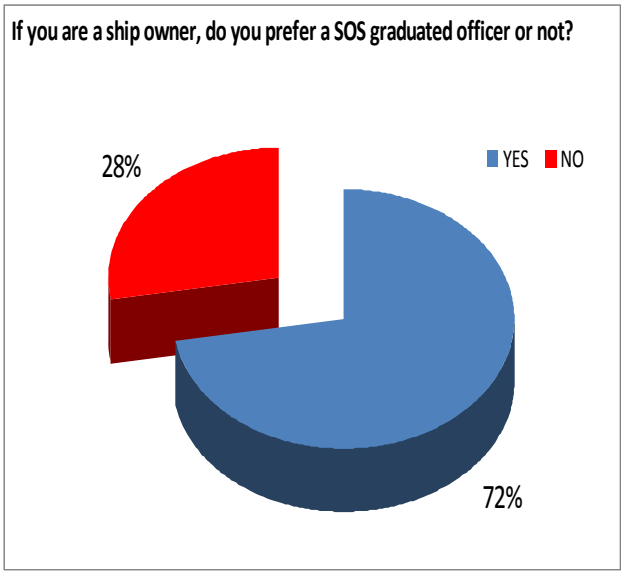

Is the SOS system offering you a better maritime education opportunity when you compare to your friends who are undertaking a traditional Turkish education?
25%
YES
NO
75%

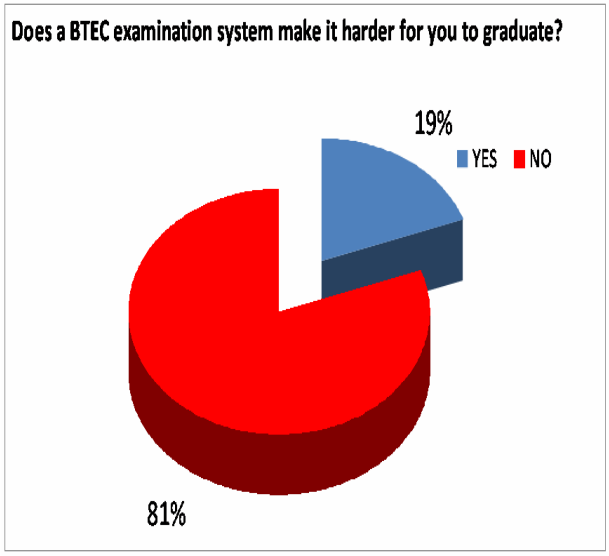

Is SOS system appropriate for you to get a bachelor's degree ?
14%
YES
NO
86%

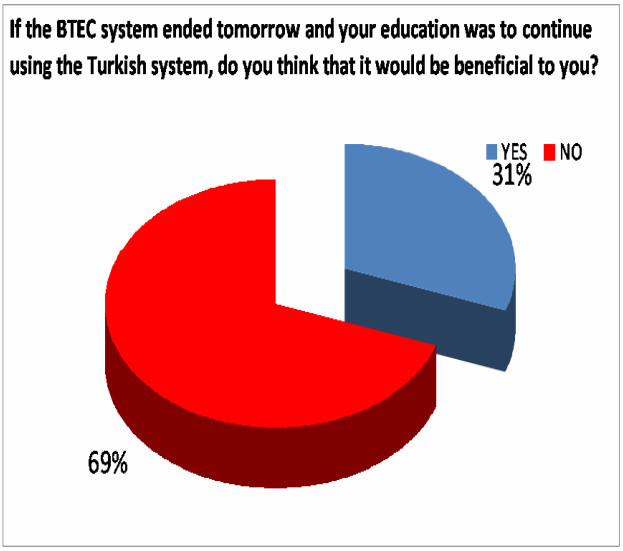

If you desire to continue and study at a university or other higher education institutions to improve yourself, do you consider that BTEC programme is an advantage for you?
25%
YES
NO
75%

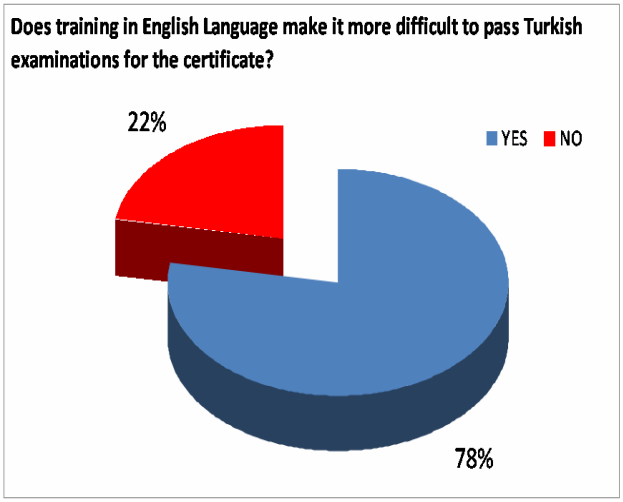

If you compare SOS sea training portfolio with the one used before, do you consider the SOS sea training portfolio to be more suitable and effective for your training?
30%
YES
NO
70%

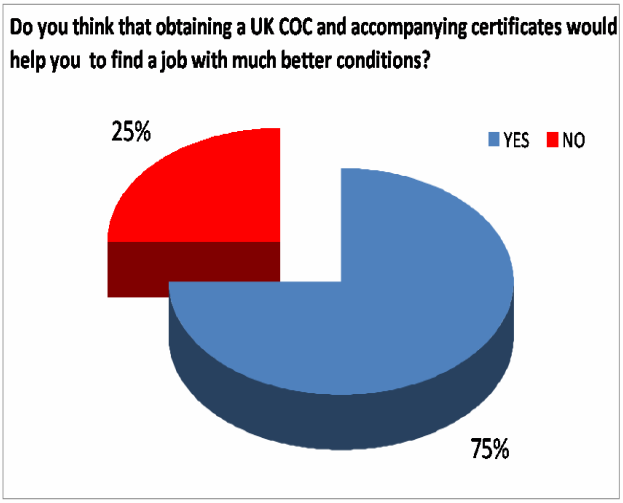

Do you think a higher level of English knowledge is essential for the success as an officer in the future ?
3%
YES
NO
97%

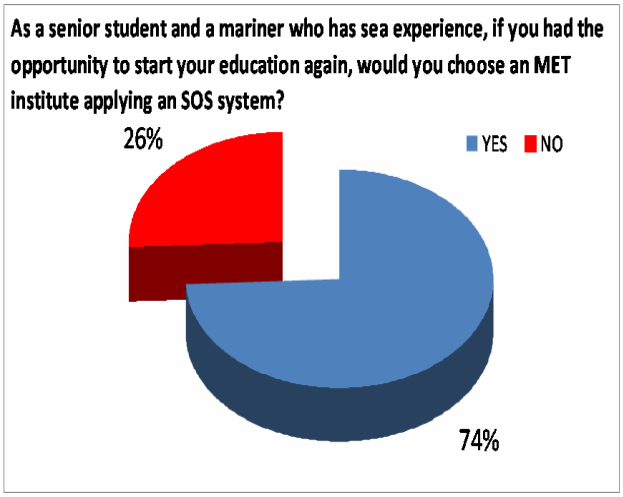

If you are a ship owner, do you prefer a SOS graduated officer or not?
28%
YES
NO
72%


Does a BTEC examination system make it harder for you to graduate?
19%
YES
NO
81%


If the BTEC system ended tomorrow and your education was to continue using the Turkish system, do you think that it would be beneficial to you?
YES
NO
31%
69%


Does training in English Language make it more difficult to pass Turkish examinations for the certificate?
22%
YES
NO
78%


Do you think that obtaining a UK COC and accompanying certificates would help you to find a job with much better conditions?
25%
YES
NO
75%



3.3 The results of the survey

- At this stage, 70% of cadets are in favour of the programme. They are fully aware of the importance of improved English language skills and recognise that this will help them in the future as an officer. They consider having a BTEC diploma as a privilege.
- Surprisingly, using English language in lessons and examinations seems not to have a negative impact on students' learning experience as was expected.
- As an observation, they consider the BTEC system to have a higher pay-off in the future to them than the higher fees they pay for their BTEC education. We believe this is the main reason why they have chosen TUDEV.
- The only resistance surfaced at the question **"Does training in the English language make it difficult to pass Turkish examinations for the certificate?"**
- We share this view but have also taken necessary precautions. For every subject, comprehensive Turkish learning material has been prepared by the lecturers. Also special courses were planned.

3.4 The negative factors affecting the system

To identify the negative factors affecting the system at present in TUDEV and to amplify the marginal negative responses at the survey, a set of questions were asked to the cadets. The answers have 5 effecting levels. From one point (is not effecting) to five points (effecting too much).

FACTOR	EFFECTING LEVEL
Low quality entry into the programme	3.8
Insufficient basic English language training	3.7
Difficulties to understand the foreign lecturers	3.7

FACTOR	EFFECTING LEVEL
Deficient library	3.5
Lack of text books	3.5
Poor attendance by students to lessons	3.5

FACTOR	EFFECTING LEVEL
Deficiency of lecturers with good English language skills	3.4
Assessment in English	2.9
Having additional units including local requirements	2.9

4. Conclusion

As a result of this study the advantages and disadvantages of BTEC and training using theEnglish system has been evaluated. This evaluation will be used as a guidance to overcome the difficulties and improve the system**.**

Advantages of BTEC and training in English:

- Opening new horizons to cadets, they may find jobs under every flag
- An excellent English learning opportunity, which they will use also in the Turkish flag
- Up-graded effectiveness to work with multinational crew
- Much more detailed training programmes
- Comprehensive and more up-to-date education and training resources
- Chance to convey huge experience of a country which has a long maritime tradition
- A good promotion of TUDEV and aid to recruit new students
- Opportunity for developing funded European and international projects in support of the BTEC system
- Opportunity to receive accreditation from international professional bodies
- A true criterion referencing assessment system - zero defect

Disadvantages of BTEC and training in English:

- Initial problems of understanding due to language difficulties
- Hard to find experienced Turkish lecturers

- More education time because of additional requirements
- Harder to achieve Turkish certificate examinations as well as the BTEC qualifications
- A more expensive system of training

In the light of overall assessment the following items are considered to be carefully investigated to improve the MET education and training in English. These issues can be used and considered by the other countries who intend to deliver their MET programmes in English.

- Advantages of the BTEC system outweigh the disadvantages. The remedies to eradicate the disadvantages should be carefully considered.
- Students are in favour of the BTEC training programmes. The resistance at the beginning can be removed by explaining the advantages of the system to the students.
- Moreover, the students are able to understand that MET in English is beneficial for their future career improvement.
- A detailed study is required to eliminate the negative impacts of some of the factors in the overall system.
- According to the outcome of the survey the main problems are not because of the new system but because of the shortcomings to support the system.
- Simulator training requires additional resources and a serious programme of staff development for effective use of simulators as a teaching and learning tool. An intensive project should be carried out regarding the recruitment of foreign lecturers who are essential to support the system in particular at the commencement of the system.
- Precautions should be taken to improve Basic English language training before starting the main programme.
- It is highly recommended to continue delivering MET in English programmes in line with the BTEC system.
- To improve general maritime knowledge, morale and social life of cadets the following additional issues are proposed;

  - Visiting maritime museums, VTS (Vessel Traffic Services) Stations, ports and taking briefings,
  - Having conferences on maritime related subjects,
  - Encouraging visits to art museums, theatres, sports events,
  - Participating in national and international projects,
  - Improving social, artistic and fitness facilities in MET institutions.

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Me Syllabus and Examination----A Contrastive Study of China MSA's ME Syllabus and College English Curriculum Requirements

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Abstract

In China undergraduates in Maritime Universities and Colleges shall pass the National Seafarer Competence Examinations (NSCE) and relevant assessments required by China MSA before qualifying for working on board vessels. The Maritime English (ME) competency examination, the toughest subject for most examinees, is also the most controversial among candidates and instructors. For one thing, all the question items are of multiple–choice type, which is widely regarded as not being able to test genuine English competency (There was one section of Chinese to English translation accounting for 20% before 2008). For another, the great majority of the tested questions focuses on navigation knowledge rather than language acquisition. What's more, some subject knowledge question even poses a challenge for the related subject teacher or instructor. The test paper is designed and developed by China Maritime Service Centre (CMSC) based on its officially published ME Section of Seagoing Vessel Seafarers Competency Certification Examination Syllabus (hereinafter referred to as Syllabus) which does not describe the language skill requirements such as listening, speaking, reading, writing and translation but lists as many as 38 navigation-related knowledge items. It can be described as a conglomeration of all the navigation knowledge required of a maritime undergraduate. A random survey indicates that quite a few examinees prepare for the CMSC-based ME examination by means of rote memory of thousands of questions and keys from question databanks available. Comparatively, College English Curriculum Requirements (CECR) devised and developed by China Ministry of Education gives not only a detailed and specific description of the language requirements in listening, speaking, reading, writing and translation but also supplies recommended vocabulary. The CECR-based College English Test (CET) Band Four and Band Six enjoy both popularity and credibility among students and their employers. Through a contrastive study of the syllabi of NSCE and CECR and their respective sample test papers,

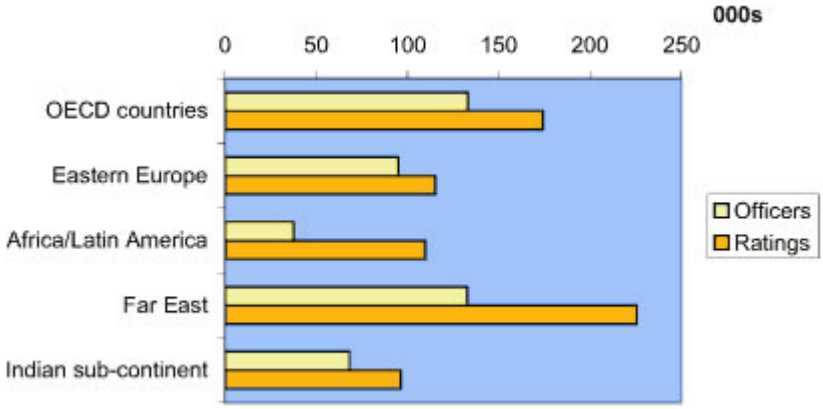
the present paper comes up with the necessity to redevise or rewrite ME syllabus and offers a rough one.

Key words： ME　MSA　CET, syllabus, contrastive

1. Introduction

There is little argument among the maritime professionals that ME is the most important subject, as it is legally stipulated by the IMO that English is the only common language on board the vessel where the seamen come from more than one country speaking different languages. It is also acknowledged that up to 80% marine perils have resulted from lack of adequate competency of the English language. It is no exaggeration that a seafarer without required knowledge of ME cannot find a working place on an international seagoing vessel with a multinational crew. The importance of ME is further testified to by the concerted efforts, international, national or corporal, from the conventions of STCW (Officers of the navigational watch now require adequate knowledge of written and spoken English to understand charts, nautical publications, meteorological information and messages concerning the ship's safety and operation. They also need to be able to communicate with other ships, coast stations and multilingual crew, and to use the IMO Standard Marine Communication Phrases(SMCP) GMDSS radio operators, which in practice now include most deck officers, require a knowledge of English, both written and spoken, for the communication of information relevant to the safety of life at sea.), the IMO SMCP(…using standardized structures for the sake of its function aspects, i.e. reducing misunderstanding in safety-related verbal communications, thereby endeavouring to reflect present maritime English language usage on board vessels and in ship-to-shore/ship-to-ship communications.), IMO's Model Course Maritime English 3.17(In reference to the IMO model course for Maritime English, colleges and training institutions should note that this course more than fulfils the competences regarding English language contained in the STCW Convention, 1978, as amended.) to the commercial body like the Marlins，the developer of MarTEL (MarTEL, a EU-funded Leonardo Project, is a standardised test of Maritime English for safer seas. It is acknowledged by all concerned that effective knowledge of English at sea and in ports is a must for all seafarers responsible for safety and security of the ship, its crew and its passengers.), TUMSAT's TOMEC, Test of Maritime English Competency (aims to improve Maritime English Education at the TUMSAT and one of its main goals is to develop a standardized test that assesses Maritime English Competence.) and China's National Seafarer Competence Examinations (NSCE), all multiple-choice type standardized computer-based Maritime English Competency Examinations. It seems that everyone involved in international shipping voyages does whatever lies in his power to push ME forward, but at every IMEC gathering, complaints, worries and even disappointments about the dissatisfaction with poor

command of English by the marine staff can be heard. China is no exception in its supreme concern with ME as it is one of the only three required Competency Certification Examinations set in implementation of the STCW 78 for four-year system undergraduates, the other two subjects being navigation and COLregs. It should be noted that China has the largest number of seafarers in the world but, according to BIMCO/ISF estimates (see the following table), at the moment most of these (Chinese seamen) work on the Chinese fleet, meeting domestic requirements.



Supply by Area of Domicile 2005 (Catering and hotel staff excluded)
Source: BIMCO/ISF estimates

What has caused this shortage of China's seafaring personnel working on board international vessels? There may be different reasons for this downsize of marine labour export, but one distinguishing cause is their inadequacy in English competency, especially communicative competency. The next question to be asked perhaps is what leads to the poor command of their English. The tentative answer is that China's MSA-stipulated Maritime English Competency Syllabus (hereinafter referred to as the Syllabus) shall be held accountable for all this. This paper attempts to find the answer by comparing the Syllabus with the College English Curriculum Requirements (hereinafter referred to as the Requirements). Then, a comparison is made of the different testing forms and items deriving from the Syllabus and the Requirements. The tested questions of the Syllabus are from the official version of No.48 903, the last paper-based Maritime English test paper set by China's MSA, after which all Maritime English examinations are tested in a computerized multiple choice type form. There are five different levels ranging from 901, a test for Masters on seagoing ships of 3000 gross tonnage to 905 for the third officer on near-coastal ships of 500 gross tonnage. Discussed in this paper is ME 903, an examination intended for undergraduates or on-service seamen intending to work in the rank of the second and third officers on board seagoing ships of 3000 gross tonnage and above of unrestricted navigation areas.

2. Definitions of Syllabus

According to Longman Dictionary of Contemporary English, a syllabus is a plan that states exactly what students at a school or college should learn in a particular subject. Based on Wikipedia, it is learned that the syllabus is descriptive, set out by an exam body, used to ensure consistency between schools and that all teachers know what must be taught and what is not required. Exams can only test knowledge based on information included in the syllabus.

3. Maritime English Syllabus

3.1 Contents of Maritime English Syllabus

Maritime English Syllabus has been developed by the MSA of PR China and a series of relevant subject examinations including ME examination have been said to be developed by China Maritime Service Centre (CMSC) based on the abovementioned Syllabus. The Syllabus, take the Level 903(for second and third officers only) for example, can be described to be very rich in contents and heavily loaded, because there are as many as 38 navigation knowledge items to be tested. All these items are parallel-listed, which means it cannot be decided that one item is more important than the other. What's more, some items are much generalized, leaving instructors and examinees confused about how much or how exhaustively they must prepare themselves for, for example, STCW Conventions and relevant regulations accounting for only one item of the 38 items. As is known to us all, STCW is an international maritime convention, whose difficulty is reflected in its vocabulary and complicated grammatical structure and long intricate sentences. In China even if one passes the CET band 6, a test requiring a vocabulary of 6395, will find it difficult to read through. What's more, nobody will agree that every word or every article from the STCW shall be required of or understood by the future third and second officers.

To help better understand how complete the Syllabus required of the rank of the third and second officer is, listed below are all the 38 items:

1. Other nautical publications (light lists, almanacs, seamen handbooks, ocean passage routes, etc); 2. Charts and chart paper works; 3. Notices to mariners and other warnings; 4. Ship logbooks, night navigating orders, standing orders; 5. Accident reports at sea (collision, stranding, fire, spills, casualty, etc); 6. ISM; 7. PSC documents and reports; 8. STCW; 9. SOLAS; 10. MARPOL; 11.Anchoring and berthing and unberthing operations; 12. Coastal and ocean navigation; 13.COLregs; 14. Terrestrial navigation; 15. Tides; 16. Cargo handling; 17. Tallying and measuring operation; 18. Meteorological reports and navigation at sea; 19. Meteorological phenomena at sea; 20.Ship structure; 21. Ship equipment; 22. The application of radar and ARPA; 23. The application of magnetic compasses and gyro compasses; 24. The application of GPS, VDR, AIS, ECDIS, etc; 25. GMDSS; 26.VHF; 27. Deck and hull

maintenance; 28. Riggings、fittings and their maintenance; 29. Ship stores and management; 30. SAR at sea; 31. Firefighting at sea; 32. Survival at sea; 33 Oil spill treatment and plugging; 34. Medical work at sea, MFAG and EMS; 35. Ship maintenance; 36. Cargo damage and harbour work; 37. Something about decklogs; 38. Something about ship safety.

From what is listed above, it can be boldly assumed that quite a few navigation courses may spring up and be delivered in the native language separately, such as VHF, GMDSS, ARPAR, meteorology, etc.. No wonder the Syllabus is jokingly referred to as a conglomeration of all required navigation courses. For a test-taker, if he wants to pass the Syllabus-based ME competency examination, it means that he shall understand all the required navigation knowledge, in other words, this is not a test to primarily check ME proficiency, but a comprehensive maritime knowledge examination compressed in one single paper known as the ME examination.

3.2 Problems with Maritime English Syllabus

Compared with the Requirements，the Syllabus has at least the following five problems

There is no description of Objectives. The Objectives of a syllabus is intended to answer the question why this syllabus is developed. For what purposes and gaols will the syllabus aim to achieve. The Objective is an integral part of a good syllabus.

There is no description of the specific requirements of the language skills，such as listening, speaking, reading, writing and translation. The syllabus should be descriptive, giving the syllabus user an idea of how far or how broadly he shall deal with the topics of the Syllabus. If no specific or at least generalized requirements on the language skills are described, not only teachers or instructors but also students or trainees will be put into a dilemma. They will have no orientations. Teaching and learning may be left random and unguided as there is no specific standard to test the depth and length of the learning points.

There is no publication of the China MSA-approved recommended ME vocabulary, not to mention vocabulary lists for the specific different five levels. Vocabulary is a pivotal link in the Syllabus. It is true that nobody can understand every nautical word and there is a vast sea of nautical vocabulary if maritime reading materials are extended. But a good Syllabus will never fail to supply a syllabus-based vocabulary, especially when there is a nation-wide test set according to the Syllabus.

There is no guidelines as to how to implement the Syllabus, ranging from teaching instructions, teaching hour allotment, etc. It is understandable that the Syllabus cannot be too exhaustive, it can only be broadly prescribed, something like a summary of important points. Different teachers and different academies may have different understanding of the Syllabus. To some degree, that's good. But there is a syllabus-based national ME test, there should be some instructions about what is more important and what is less important or how much or little teaching or learning concerning some Syllabus-required item shall go. For example, as is

listed above, STCW, SOLAS, MARPOL, ISM are all required as separate items in the syllabus. But these conventions themselves are very duty-loaded, especially SOLAS, hundreds of pages, if there are not teaching instructions, teachers may feel puzzled about where to start and where to end, because it is impossible to read or teach from the very first word to the very last one of the SOLAS.

There is no nationally recognized or approved acceptable textbook. Indeed, there are a few ME textbooks available for classroom use, some are compiled exactly based on the knowledge items of the Syllabus, take for example Mr Wang Jianping's Maritime English published in August 2009 which is not a nationally approved or recognized textbook. A lot of teaching textbook problems which Professor Boris has pointed out in his report A survey of Maritime English Teaching Materials can be found there.

1. The purpose and objectives are not clearly explained in the introduction or foreword
2. Lack or complete non-existence of teacher's books or student's worksheets.
3. Not supported by audiocassettes or other video projects
4. No keys to the exercises are offered
5. Competence-based exercises are not sufficiently provided
6. Low stimulation of developing students' own learning strategies
7. Development of pronunciation skill exercises is not found
8. Vocabulary development is not designed
9. Annotations of text-related difficult vocabulary are not carefully picked out and pointedly annotated
10. Lack writing, listening and speaking and even translating skill development exercises.

4. College English Curriculum Requirements.

4.1 Characteristics and Objectives

College English Curriculum Requirements (hereinafter referred to as the Requirements) has been drawn up to provide colleges and universities with the guidelines for English instruction to non-English major students

The objective of College English is to develop students' ability to use English in a well-rounded way, especially in listening and speaking, so that in their future studies and careers as well as social interactions they will be able to communicate effectively, and at the same time enhance their ability to study independently and improve their general cultural awareness so as to meet the needs of China's social development and international exchanges.

4.2 Three Levels

The requirements for undergraduate College English teaching are set at three levels, i.e., basic requirements, intermediate requirements, and higher requirements. Non-English majors are required to attain to one of the three levels of requirements after studying and practicing English at school. The basic requirements are the minimum level that all non-English majors have to reach before graduation. Intermediate and advanced requirements are recommended for those colleges and universities which have more favourable conditions; they should select their levels according to the school's status, types and education goals.

4.3 Basic requirements

\4.3.1 Listening

Students should be able to follow classroom instructions, everyday conversations, and lectures on general topics conducted in English. They should be able to understand English radio and TV programs spoken at a speed of about 130 to 150 words per minute (wpm), grasping the main ideas and key points. They are expected to be able to employ basic listening strategies to facilitate comprehension.

4.3.2 Speaking

Students should be able to communicate in English in the course of learning, to conduct discussions on a given theme, and to talk about everyday topics in English. They should be able to give, after some preparation, short talks on familiar topics with clear articulation and basically correct pronunciation and intonation. They are expected to be able to use basic conversational strategies in dialogue.

4.3.3 Reading

Students should generally be able to read English texts on general topics at a speed of 70 wpm. With longer yet less difficult texts, the reading speed should be 100 wpm. Students should be able to do skimming and scanning. With the help of dictionaries, they should be able to read textbooks in their areas of specialty, and newspaper and magazine articles on familiar topics, grasping the main ideas and understanding major facts and relevant details. They should be able to understand texts of practical styles commonly used in work and daily life. They are expected to be able to employ effective reading strategies while reading.

4.3.4 Writing

Students should be able to complete writing tasks for general purposes, e.g., describing personal experiences, impressions, feelings, or some events, and to undertake practical writing. They should be able to write within 30 minutes a short composition of no less than 120 words on a general topic, or an outline. The composition should be basically complete in content, clear in main idea, appropriate in diction and coherent in discourse. Students are expected to be able to have a command of basic writing strategies.

4.3.5 Translation

With the help of dictionaries, students should be able to translate essays on familiar topics from English into Chinese and vice versa. The speed of translation from English into Chinese should be about 300 English words per hour whereas the speed of translation from Chinese into English should be around 250 Chinese characters per hour. The translation should be basically accurate, free from serious mistakes in comprehension or expression.

4.3.6 Recommended Vocabulary

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Students should acquire a total of 4,795 words and 700 phrases (including those that are covered in high school English courses), among which 2,000 are active words. Students should not only be able to comprehend the active words but be proficient in using them when expressing themselves in speaking or writing.

5. Maritime English Syllabus and College English Curriculum Requirements

From the description of Syllabus and Requirements listed in Sections 3 and 4, it is learned that the former is too generalized, lacking essential elements comprising a Syllabus, such as the objectives, language skills requirements, recommended vocabulary, etc. while the latter is a detailed scientific one from which the teaching administrations can clearly know how to build accompanying curricula to implement it and the instructors and learners understand how to proceed with their college English teaching and learning. But as for the Syllabus mentioned above, Colregs makes up only one item of the 38, and as we all know, Colregs itself can be delivered in a separate course, as there is not a single word to describe the scope and extent of it, therefore, teaching may be undertaken unintentionally and differently in different universities. Some may do it a bit in a detailed way, others in a broad and generalized way. And for students, it will be bothersome for them to grasp the gist and core knowledge of the Syllabus. On the other hand, different jobs may have different language skill requirements. Take the cadets working on deck and in the engine room for example, the former, the deck officers, may be required to use spoken English more frequently, they should be more trained in this language aspect, while the latter, the engine

officers, may be required to have a better reading ability. That is to say, of the five language skills, for a deck officer, a higher demand on listening and speaking ability shall be imposed than the other three language skills. And these shall be prescribed in the Syllabus. Besides, as we learn that at the very basic stage of the Requirements, a syllabus-based vocabulary is recommended, that is 4794, with which 903 of the total 1190 unique words from the COLregs, and 1495 of the total 2058 unique words from the IMO SMCP, 2002 overlap, accounting for 75.9% and 72.6% respectively. If affix knowledge is somewhat neglected, like inspect and inspection, inspection is not listed in the Recommended 4794 vocabulary of the Requirements, the overlapping will be much higher. However, the fact that should be never overlooked is that quite a few of these basic requirements vocabulary have the specific maritime connotations or can only be understood in the maritime context, for example, port five, a draft of ten meters, the ship was grounded, Shipped seas on deck, etc. Taken altogether, there is every need to compile a maritime Syllabus vocabulary so that both teachers and students will be more oriented to pursue their maritime English studies. And the exam body will find it more reliable to set its test papers. To conclude, modelling after the Requirements, the Syllabus should be redevised and compiled, making it a bit more handy one, adding the following items: the Objectives, Language Skills requirements, Recommended Vocabulary and summarized teaching and learning instructions.

6. Syllabus and Examination

6.1 ME Examination

Syllabi and examinations are closely interlinked. Syllabi should be objective and practical. As for as maritime English syllabi are concerned, they should be set to test the genuine proficiency of ME, which focuses on communicative competency in the context of vessel operations. Syllabi also serve as the purpose of a teaching wand, as all teaching organizations will be directed to devise more amplified curricula in the light of the syllabi. Therefore, the persons to take charge of syllabi development must be well chosen. They should be those who are both experts of English and navigation and still engaged in daily teaching activities. If syllabi are not impeccably designed, teaching and testing will be imperfect and impacted, as exams are supposed to test knowledge based on information included in the syllabus. Also, examinations should be objective and consistent, trying to avoid the tendency that this year's tests are easier or more difficult than last years'.

What and how should ME be tested and what should be focused on in it? There will never be an only answer unless there is only one globalized syllabus and ME test. From the internationally reputed Marlins' ME test to the classroom-based TOMEC by TUMSAT, it can be learned that multiple-choice questions (MCQs) and standardized answers are preferred. In the CMSC-based ME examination, the question are all MCQs, divided into two sections, 88

sentence-type MCQs and two subject-related reading comprehension type MCQs. All the candidates, no matter whether they are undergraduates or on-service seafarers, wishing to work as third or second officers, shall take these computer-based exams. As has been discussed in Section 3, the Syllabus is too much generalized, only listing 38 required tested items and not nationally approved textbooks, there appear such unexpected phenomena, that is, rote memory of keys by candidates. It is unfair to scold the test-takers, as those who passed the CET-band 6, a higher level college English test requiring a vocabulary of 6495 cannot pass this test just because of not reciting keys, and a student who repeatedly failed to pass the CET-band 4, a basic requirement college English test requiring a vocabulary of 4794 passes the CMSC-based ME by means of rote memory. How can rote memory ensure ME proficiency? What's worse, if the test-takers find rote-memory can help them to pass the test, how can teachers force them to do solid study work? So, it is high time to recruit the most reliable linguists and navigators to revise and redevise and redevelop the Syllabus, next compile nationally approved Maritime English textbook, then compile a recommended vocabulary for students to focus on, as there is also a sea of maritime vocabulary which nobody is able to memorize. Finally, redevise exam questions. MCQs is always controversial among instructors and examiners as they encourage blind guessing and testwiseness among the candidates, though it is generally agreed that MCQs are the most inexpensive and fastest ways to get the results and easy to score, especially in the cases where the tests are computerised, the results come out the moment the tests are over. But for undergraduate test-takers, 100% MCQs are not scholastic but gambling and dishonest to some degree.

The next question to be discussed is what should be focused on in ME tests? Should the subject knowledge be prioritized to the neglect of language competency? Subject knowledge is acquired mainly through lectures delivered in the native language, excluding English-speaking countries, so when the same or even more difficult subject knowledge is tested in the form of a foreign language or by translating the question items and choice items from the native language into the foreign language, it may be blurring or confusing sometimes to the mind of the test-takers. Look at the following five questions from No 48 903, a ME test for third and second officers in China, the question series numbers being the original ones, including linguistic pitfalls

15. Which signal of the followings is not provided with onboard lifeboat?

A. Rocket parachute signals B. Buoyant smoke signals

C. Hand flare signals D. Self-igniting signals

16. When steering by autopilot, how often should manual steering be checked?

A. Every day B. When time allows

C. At least once a watch D. No checking is necessary

17. Who must be familiar with the Muster List and Emergency Instructions onboard?

A. The captain only

B. The officers only

C. All crew members and other personnel onboard

D. Passengers only

18. Radar reflectors are required for _____.

A. all fishing vessels over 39 feet in length

B. sail-propelled fishing vessels

C. all fishing vessels of less than 200 GT

D. wooden hull fishing vessels with a poor radar echo

19. A vessel emitting harmful substances into the air or spilling oil into the sea is a _____.

A. Polluter B. Emitter C. Spiller D. Oiler

These fives questions require more subject knowledge than ME knowledge or English proficiency, as these questions can also be used (maybe more appropriate) to test the subject knowledge when translated into Chinese. Perhaps some may disagree that ME should be tested in this Maritime context. But the question is that if all questions are MCQ type and navigation content-based, then English proficiency may be sacrificed. The test items can be MCQ type, like now we have multimodal transport, but the question is how much and what percentage? From Denis et al's MCQ survey, many countries such as Europe's Germany, Italy, Ireland, the UK, etc, Asia's Indonesia and Africa's South Africa, and even Hong Kong, China do not use MCQs in their ME tests. So, MCQs are not compulsory in the ME tests. The subjective items of the ME shall be taken into consideration. It is suggested that the test can be a bit subjective and language proficiency can be fostered by adding such subjective items as gap-filling, sentence rewriting, completing sentences, guessing the meaning from the context and most important section is translation, especially from English into the native languages.

6.2 College English Test（CET）Band 4 and Band 6

In China, College English teaching is given for the first four semesters of the eight semesters to the undergraduates and a total of 350 or so teaching hours may be allotted to it. Almost all the students are required to pass the CET 4, as it is the basic requirements of English. CET Band Four are intended to test the general English proficiency. The four language skills are tested except spoken English, which will be given to those candidates who pass the CET at an excellent score, 85 points out of 100. The listening and reading takes the higher percentage, accounting for 35% respectively. The subjectivity and objectivity are equally treated, unlike ME, which is 100% MCQ type. Take listening ability test section for example, dialogues and passages are of MCQ type, but there is a gap-filling section known as Compound Dictation.

6.3 A recommended ME Testing Format

Based on the constructive study of the ME and CET, a new type of ME testing format is suggested. All the tested materials are chosen from maritime context. Subjectivity of the test should account for at least 35 percentage. All the five language skills (Speaking ability shall be given separately in the form of an interview or assessment) shall be tested. Enough percentage shall be given to translation, as this is a real effective way to check the language proficiency of an ME undergraduate. A rough suggestion of the percentage of language proficiency testing skills are as follows:

Listening: 40%
Reading: 25%
Vocabulary 15%
Translation：20%

7. Conclusion

From what has been discussed above, it can be concluded that China's MSA ME Syllabus leaves much to be desired and urgently needs redevising. The point is that the right persons to rewrite this Syllabus shall be recruited. But before doing so, a thorough and contrastive syllabus researches are badly needed to have a good start. In this respect, the Requirement can serve as a good model against which to redesign the Syllabus. The following is what the present author attempts to redesign the language skill and vocabulary parts of the Syllabus.More funded or sponsored researches are required to make a better one.

1) Listening

Students should be able to understand the basic maritime terminology and use it in the context of maritime work. They should be able to understand the general ideas of bridge-to bridge communications, can communicate with co-workers during work with the help of non-linguistic assistance such as body language and gesture. They should be able to understand the standing orders and other work instructions given in English with some accents. They should be able to get the rough ideas of maritime-related weather reports, navigational warning, emergency calling in English. They should be equipped with an ability to improve their listening ability through working with multi-ethnic seafarers.

2) Speaking

Students should be able to speak English understandably and confidently. They should be able to ask questions and offer answers related to their work in English. They should be able to talk about everyday life besides topics of work. They should be able to make oral accident reports or some other reports that require the use of English. They should be able to chat about general daily topics in English. They should be able to use survival language skills when they are ashore or in the harbours or undertaking daily activities abroad. They should be able to improve their pronunciation and intonation with the help of multimedia.

3) Reading

Students should be able to read general nautical publications at a speed of 50 wpm with the help of dictionaries and on-line search. With longer yet less difficult texts, the reading speed should be 80 wpm. Students should be able to acquire reading skills such as skimming and scanning. They should be able to understand maritime telegrams, telexes, faxes, charts, meteorological messages and other nautical publications and sea-related safety reports. They should be able to improve their ME through lifelong reading practice.

4) Writing

Students should be able to fill up deck logs and other required forms correctly. They should be able to write accident reports with the help of dictionaries and on-line search. They should be able to write within 30 minutes a short composition of no less than 120 words on maritime reports or summaries of maritime affairs. The composition should be coherent in content and semantically understandable. Students are expected to be able to have a command of basic writing strategies.

5) Translation

With the help of dictionaries, students should be able to translate maritime reports, telegrams, telexes, faxes and other writings from English into Chinese and vice versa. The speed of translation from English into Chinese should be about 200 English words per hour whereas the speed of translation from Chinese into English should be around 150 Chinese characters per hour. The translation should be basically accurate, free from serious mistakes in comprehension or expression.

6) Recommended Vocabulary

Students should acquire a total of 5800 words including 4795 of basic requirement vocabulary and common marine orders and emergency call phrases. They should be able to understand both aurally and orally every word of the IMO SMCP. They should be able to read independently the COLREGs. They should be able to distinguish between the general purpose semantics and maritime context meanings of 2500 active words.

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A Brief CV

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Attention Monitoring in Knowledge Management While English Language Training

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Abstract

The present work is devoted to the most intensely studied topics within psychology and cognitive science. A relatively new body of research is investigating the phenomenon of attention within the frames of knowledge management and informational exchange.

We attempt to view attention as combination of sophisticated experimental paradigms from cognitive psychology and new brain imaging techniques.

The role of attention in the discursive activities is traced from the initial step of thought formation up to a readymade product of text activity- text and in the procedure of texts manipulation.

The purpose of this over view is outlining facilitating means of speech construction and enlarging the scope of information processed while training.

We are trying to find and select tools for monitoring trainees' attention for them to attain linguistic awareness in orchestration of training according to global concretization approach smoothly turning from a didactic discourse into a natural speech processing.

We denote types of attention and ways of monitoring them while knowledge managing at training process.

Key Words: Attention monitoring, knowledge management, memory facilitating, attention spans, cognitive processes, emotional tinges

1. Introduction

The article is constructed to touch upon three important psychological issues:

- Philosophy of discursive process mentioning peculiarities and steps of speech organization.
- Memory and consciousness focusing on objectivity and subjectivity of memory and storing and retrieval of information.
- Attention defining types of attention and discussing such essential properties as cognitive control, cognitive dissonance and catharsis.

In conclusion we underline the importance of psychological focus while training speaking.

2. Philosophy of Discursive Process

2.1 Peculiarities of Speech Organization

All actions start with thought which is the activity on the plane of consciousness.

Production, processing and perception of information is a simultaneous process performed by consciousness. Text is a set of symbols modified and determined to interface to express its cognitive and communicative function. Symbol is an instrument of introducing certain content to assist in recognizing this content. Language does not transmit information. Its principal role is expressed in creating domains and functional basis for speakers to use common means in informational exchange. To be manifested thought must be charged with a strong will. Thought is assumed as a reflex which brakes at the end.

One property that symbols on paper or even in a dynamic computer lack that symbol in brain process is **the capacity to pick out their referents.** It is what the term "grounding" refers to. Meaning is grounded in the robotic capacity to detect, categorize, identify and act upon the things that words and sentences refer. These features –detectors must be either inborn or learned.

2.2 Stepped Character of a Discursive Process

We all possess the neural circuitry by which emotions routinely highjack the brain, seizing control of our decisions and actions usually so quickly that the process is completely beyond our control/ Colman P 1998/.Our Intellect is always active. But mostly is preoccupied by thinking of SELF

Discourse is not a final product but a modeled unit of the whole continuous interface /Sheldon Klein 1972/. The text emanates the energy of its own and receives emanations from mental fields involved in discursive actions setting up a wholeness of a verified knowledge. /Myshkina 1999/. The logics of ideas are more difficult to denote than the logics of mere facts.

Both are realized in subjective and communicative dynamics of mind creativity. Psychologists proved stepped character of a discursive process: concrete and visual, logical and discursive, intuitive. Evaluative aspect of discursive process is in a close contact with emotional aspect.

2.3 Brain, Mind Computation and Phonological Performance

Mental life of a personality is represented linguistically by the world picture which is expressed by different means and interpreted by models organized into a system based on domain, certain contexts or emotions,/ M Wolf 1989/ .Phonologically language represents the system of pure symbols because they mostly do not coincide with the meanings. Not able "to speak" the right hemisphere of our brain is able to understand linguistic commands. The right hemisphere reacts better for nouns and experiences difficulties in dealing with verbs. According to a wild theory of cognition thinking is just a form of computation. But computation in turn is just formal symbol manipulation according to rules, that are based on symbols' shape not their meanings. The symbols in an autonomous hybrid Symbolic + Sensor motor system connect its internal symbols to the external objects it refers to. Speech production is based on a number of cooperating brain zones each of them aiming at a specific function in speech organization / Luriya1998/

Our brains do need to have "know –how" to execute the rule they need to be able to actually pick out the intended referent of our words. But we do not need to know how our brains do that. Symbol grounding problem occurs when and whatever" processing" is required in order to successfully connect the inner word and the outer meaning.

Computational theories explain how the brain picks out its referent. Cognitive neuroscience may eventually arrive at the same explication in future (Pylishin 1984).

According to Searle's reasonable assumption, that whatever the brain is doing to generate meaning **it can't be** just implementation –independent computation. Symbol (word) is **a natural language** intended for perception and adequate reaction (Fodor1975).

Without perception action would be unguided and without action perception would serve no purpose. When objects are viewed without understanding, the mind will try to reach for something it already recognizes.

3. Memory and Attention in Knowledge Management

3.1 Memory and Consciousness

Attention and memory remain the main areas of investigation in education, psychology and neuroscience.

Memory as a cognitive faculty of our mind to store information about world and oneself, to keep an acquired experience by means of mental frames and representations exits to

systematize different layers of knowledge and provide an easy access to the knowledge stored. Three items count in this operation: **Interest-memory –attention.** Poor Memory is a result of minor interest and minor interest is a result of feeble attention.

While short term memory encodes information acoustically, long-term memory encodes it semantically. Long term memory is believed to be actually made up of multiple subcomponents, such as episodic and procedural memories.

In 1974, a model of **working** memory was proposed which replaced the concept of general short-term memory.

One of the basic stores of working memory- the central executive, executive essentially works as attention which channels information,

3.2 Objectivity and Subjectivity of Memory

Mechanical memory is very reliable. It keeps for user the names, phone numbers, special dates it does not require mental dexterity. It either exists or it is not available. The memory of soul is different It is a kind of creativity and thus subjective. The work of such memory is a subconscious creativity (V Atkinson1996). The assistance of symbol in recognizing certain content is manifested in reading the experience of consciousness not through universal frames of interpretation but through the unique individual symbolic description which does not disguise the reality, but on the contrary deepens our concentrating on the phenomenon and excites imagination.

3.3 Storing and Retrieval of Information

Brain contains one mental area where all tasks must be carried out. When the brain is attempting to complete two tasks, both tasks are present in the same area and compete for processing ability and speed. According to interference theory the learning of the new information decreases the retrieval of older information and this is true in Dual Task Interference. The dominant task of the two inhibits the other task from completion. It is presumed that the dominant task would be a new task.

Span performance refers to working memory capacity. It is hypothesized that we have a limited span for performance on language comprehension, problem solving and memory..

Output interference occurs when the initial act of recalling specific information interferes with retrieval of the original information. The act of retrieval can serve as failing to remember.

Memorization in spite of diverse opinion of its effective implementing is a method of learning that allows individuals to recall information verbatim.

4. Attention Monitoring in Knowledge Management

4.1 Attention and Training

Training is a complicated process based on informational exchange and dependant on the focus of participants. Creativity is affected by concentration. There is also evidence that the brain operates on a slight "delay" to allow nerve impulses to be integrated in simultaneous signals. Interference theory main assumption is that stored memory is intact but unable to be retrieved due to competition created by newly acquired information. The trainer is supposed to investigate mental states of trainees by monitoring focus of discourse and taking into consideration attention span. Attention span is the amount of time that a person can concentrate on a task without being distracted. Most educators and psychologists agree that the ability to focus one's attention on a task is crucial for the achievement of one's goal. Estimates for the length of the span are highly variable and depend on the precise definition of attention used.

4.2 Types of Attention

Focused Attention: the ability to respond discretely to specific visual, auditory or tactile stimuli.

Sustained Attention: the ability to maintain a consistent behavioral response during continuous and repetitive activity.

Selective Attention: the ability to maintain a behavioral or cognitive set in the face of distracting or competing stimuli. Therefore it incorporates the notion of "freedom from distractibility"

Alternating attention: the ability of mental flexibility that allows individuals to shift their focus of attention and move between tasks having different cognitive requirements.

Divided attention: this is the highest level of attention and it refers to the ability to respond simultaneously to multiple tasks or multiple task demands.

4.3 Attention, Cognitive Control and Cognitive Dissonance

There is a general consensus in psychology about an executive system based in the frontal cortex that controls our thoughts and actions to produce coherent behavior. This function is often referred to as executive function, executive attention or cognitive control**.**

Creativity combined with a strong focus converts intellect into a substance rotating at a high speed screening human mind from clear information. Saturated with attention the intellect produces manifestation of different knowledge. The initial stage of saturation performs certainty which results in materializing things.. The second level of saturation enlightens mind and may cause a highly comprehensive state -synesthesia /Greek, aesthetics joined with other items/ indicates perception as involuntary physical experience of a cross modal association.

Perception takes place in one or more different senses joining an unexpected demographic and cognitive constellation. Enlightened mind operates with images and the velocity of its function is extremely high.

As a part of discursive process attention operates in tandem with awareness. Awareness in mind operation presupposes planned development of relations to activate intellect. Discursive process is a motion of attention to conquer attention means mastering intellect. The way to master intellect is monitoring attention priorities choosing among four core processes of attention:

- Working memory temporarily stores information for detailed analysis.
- Competitive selection is the process that determines which information gains access to working memory.

Through top-down sensitivity control, higher cognitive processes can regulate signal intensity in informational channels that compete for access to working memory, and thus give them an advantage in process of competitive selection. Through top-down sensitivity control, the momentary content of working memory can influence the selection of new information, and thus mediate voluntary control of attention in a recurrent loop/endogenous attention/.

Bottom- up saliency filters automatically enhance the response to infrequent stimuli, or stimuli of instinctive or learned biological relevance (endogenous attention)

General ability of an individual to be attentive is judged by manifestation of the following features: Capacity, intensity, stability, discretion distribution and switch ability.

Most healthy teenagers and adults are unable to sustain attention on one thing for more than about 20 minutes at a time, but the ability to renew attention permits people to "pay attention" to things that last for more than a few minutes / watching long movies, etc./. Attention span is measured by sustained attention. People are generally capable of longer attention span when **they are doing something they find enjoyable or intrinsically motivating.** Attention is also increased if a person is able to perform the task fluently,

compared to a person who has difficulty performing the task or the same person when he or she is in the process of learning. After losing attention from a topic, a person may restore it by taking a rest, doing a different kind of activity, changing mental focus or deliberately choosing to refocus on the first topic.

Being aware of relevance and coherence we speak and interpret the speech in spite of interferences, failures, corrections and commentaries participants of communication are always able to restore where they have stopped or the level of importance referring to the reality where creativity of discourse is developing. This development can be either as a set of structural organization or a born faculty of intellectual system.

The final step of a process is comprehension control in text analyses. It is exercised by means of certain spars which create wholeness of some texts elements representing organized semantic and semiotic unit.

It is the spars which provide foundation for inner speech text scheme which is later developed into the utterance whether by speaker or by writer.

Awareness of the above elements in the text arises from their interdependence and cohesion in the hierarchy of wholeness (Luriya1979).

Cross Talk is communication between sensory inputs, processing and thoughts of the individual. Activation of two not similar processes will confuse the brain and there is conflicting communication as separate cognitive areas are activated. Contrastingly, if the two processes are similar there will be less cross talk and a more productive and uninterrupted cognitive processing. However Cognitive Dissonance (Festinger 1999) has proved to be an active provider of communication. As the larger the dissonance the more active is discursive activity which aims to restore the gap of unknown.

4.4 Achieving Catharsis

Brain activation is remarkably effective in training process by means of simulating catharsis. Catharsis originates from the repression of "immorality" In training it is connected with self-praise.

Repression has the function of removing from awareness unsuitable desires and attitudes and anxieties. When a person is highly anxious and under pressure to talk, they will not listen to the other person but will follow the abreaction sequence. They have to continue talking until the anxiety has evaporated. Only when the abreaction sequence, and the compulsive need to speak, comes to an end can a two-way dialogue begins (I Heath.2010). Excitement of catharsis makes the person feel breaking free of constraints of tradition by reversing values.

4.5 Performance Stimulation

The history of attention investigation starts with introspection studies. The cognitive revolution admitted unobservable cognitive processes like attention as legitimate objects of scientific study. Performed experiments proved a direct neural correlate of a mental process in focusing on discourse organization. Outlook into attention properties and functions affects training of speech. While training the following performance stimulating factors have been observed and implemented:

- Restoration of hidden emotions and impressions excites an interest to a subject under discussion.

The intellect "is getting ready" for receiving new impressions of the same kind and knowledge on the domain enlarges considerably. Key words are helpful and key questions on the subject set up a system of knowledge of the domain:

1. What is the origin of subject?
2. What caused the occurrence of the subject?
3. How is the subject developed?
4. What are its main features and quality?
5. What are the connections and relevant subjects?
6. How and where the subject can be applied?
7. What does it denote?
8. What are the results and consequences of possible application?
9. Can you see final stage of this subject development and its future prospects?
10. What is your opinion of the subject and why do you think this way?

- Reconciling the competence between stored and newly acquired information for better retrieval by preconception, Preconception can influence how world is perceived. There is also evidence that the brain operates on a slight "delay" to allow nerve impulses to be integrated in simultaneous signals.

  Some people can actually see the percept shift in their mind's eye. Others who are not picture thinkers may not necessarily perceive the shape shifting as their world changes. The ambiguous image has multiple interpretations on perceptual level.

- Variation of types of memories, For instance, The visuospatial sketchpad stores appropriate information It is engaged when performing spatial tasks /judging distances, imagining images, counting windows/. The episodic buffer is dedicated to linking information across domains to form integrated units. The episodic buffer is assumed to have links to long-term memory and semantic meaning.
- Making the act of organization of information more memorable.
- Accepting distinctiveness as one of the training tricks/asking to spell the words many times

- Sparing effort. Using tasks:/solve a series of anagrams, diverted order of letters or words/. Sophisticated task makes the learner to spare more effort. The more effort the more memorization.*
- Elaboration. Experiments showed that recall was higher in elaborated paragraphs than in some short ones,

Stimulating memory functions by the content to be remembered in the past (retrospective memory.Using Zigarnik effect which states that people remember incomplete tasks better than completed ones

Maintaining emotional balance and emotional thrill. Emotions can have a powerful impact on memory. Most vivid autobiographical memories tend to be of emotional event which are likely to be recalled more often with more clarity and detail than neutral events. Even odors re-activate new memories in the brains of people while they sleep.

Searching for the opposites provides mental tension just like opposite electrical poles provide electrical power. "Spider's Web" is an effective exercise for increasing electrical tension in the head of a learner to produce creative cells in learner's brain. While doing the exercise one can easily feel pleasant warmth around the head.

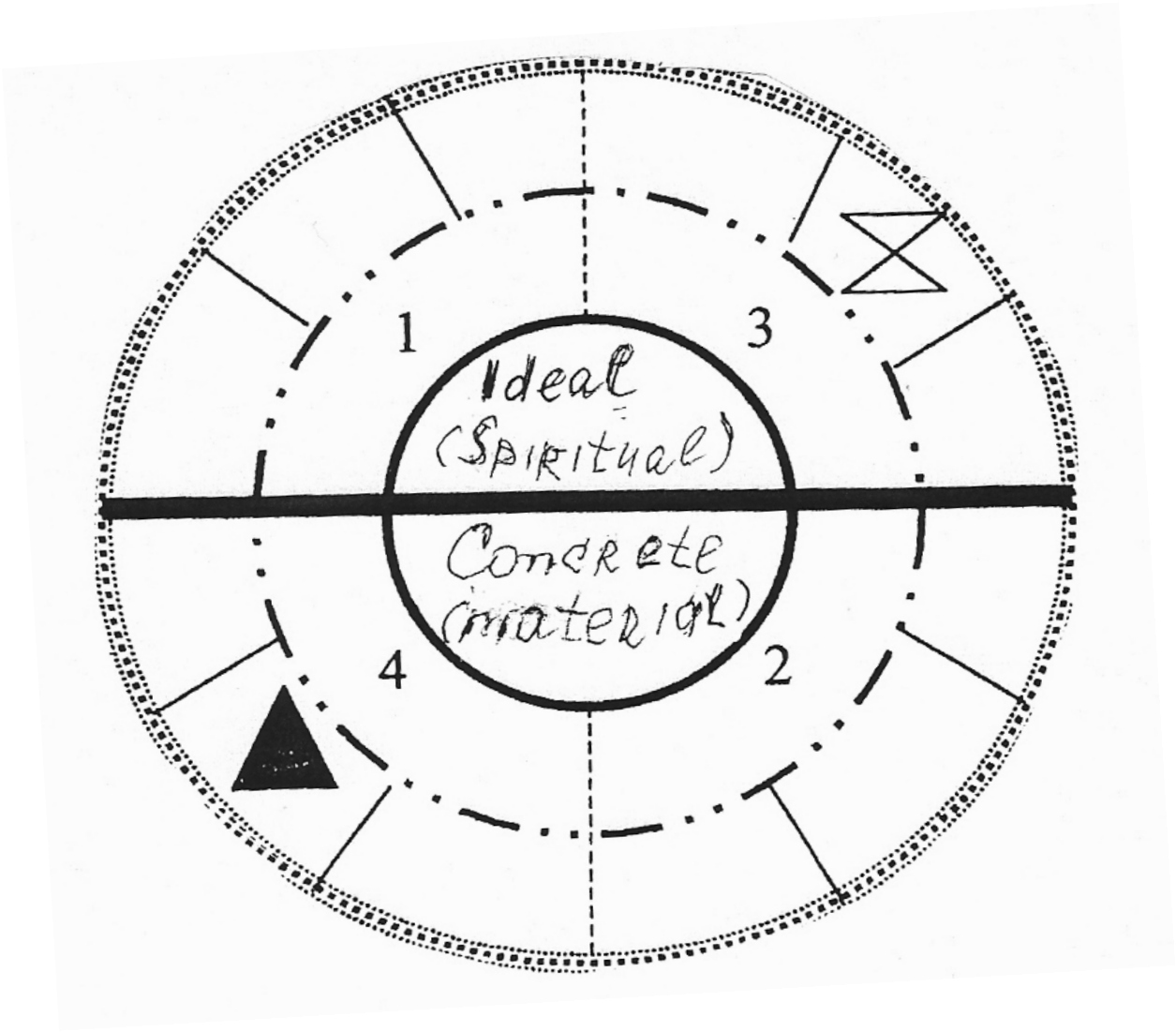

Fig 1.

The task is to seize mind's attention. Condition: Two opposites (spiritual and material) are available. Each section is supposed to have an appropriate direction and to be opposite in semantic and other characteristics. Question: What terms, words describing the subject and its properties should be inserted in semicircle, its half and each section of a semicircle? Do not use the symbolic answers, only words and word combinations. Symbols in the cells are used for indication of direction only.

A Person is not limited by perception of a certain impression only. He is able to acquire a state of abstract perceiving separate features of things and their relations

In comparison with determined and predictable animal behavior human being percepts, analyzes and concludes using new forms of reflecting reality by means of a rational experience.

Due to its spiritual nature personality avail the opportunity of a relative thinking and conscious behavior which roots go deep to the nature of spirit and certain things just like a polycemy of words remain inexplicable (N Panov 1983).

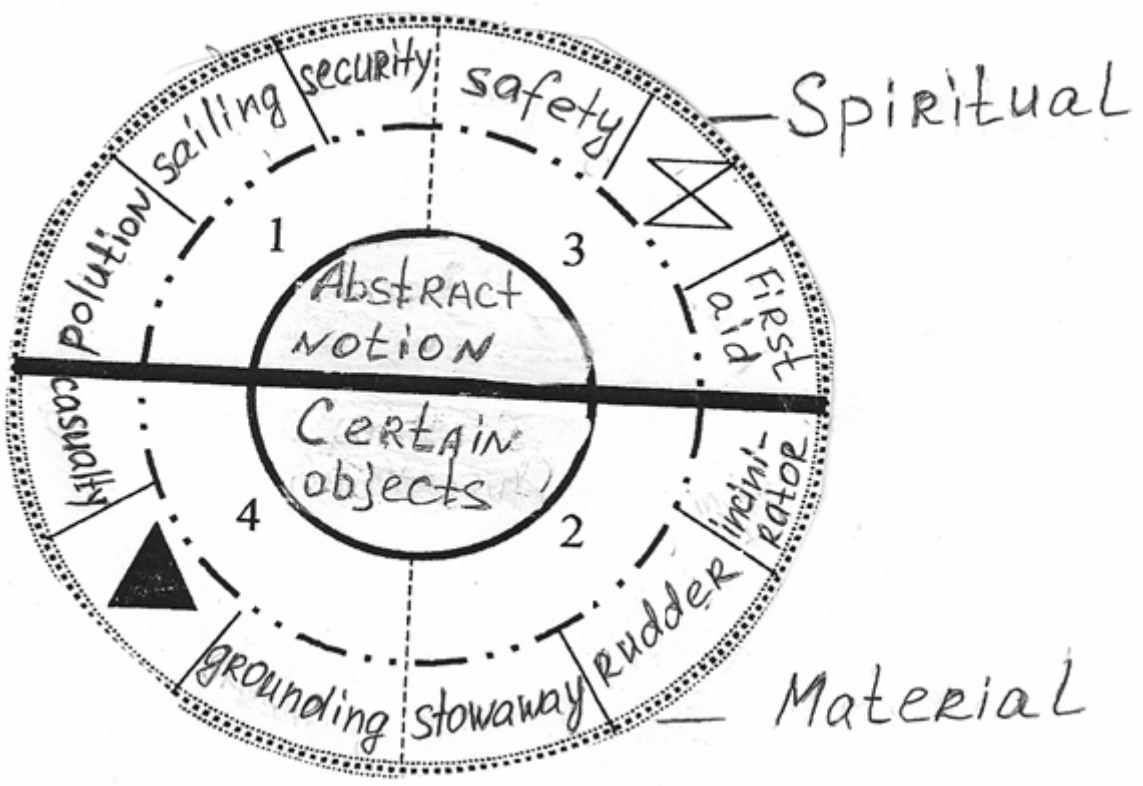

Fig 2.

- Orchestrating training by means of "filling in mental spaces" with a constant change of focus.The movement of attention is limited because of lack of information or because of superfluous Self in statements.
- Cultivating personal power of a trainee by working out the attitude to "**I"** as the center of communication. The person is a master of intellect by means of monitoring attention. I –the center.

  Moving in any direction of cognizing it is always possible to return to I /learner/ and any Information is just an attending circumstance.

5. Conclusion

Present life requires linguistic competence of seafarers which is defined not only by possessing of theoretical knowledge of the language, but by the availability of psychological tool to create a successful utterance. Every personality possesses plentitude of linguistic resources /passive vocabulary/which can be activated by a special emotional or mythological

drive. A kind of perforating will turn this passive word-stock into an element of every day communication.

The learning can be based on trial and error induction, guided by feedback from consequences of correct and incorrect categorization; or, in linguistic species, the learning can also be based on verbal descriptions or definitions. There are no "free-floating" mental states that do not also have a mental object even hallucinations and imaginings have an object, and even feeling depressed feels like something.

Attention is the sustained focus of cognitive resources on information while filtering or ignoring extraneous information. Monitoring concentration is an essential psychological tool of training process,

Psychological aspect is the key element of present speech training and mental dexterity of a trainer should choose the right focus of trainees to manipulate their states and priorities in knowledge management.

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Navigation Simulator Training and Its Development in China

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Abstract

Brifely recalls the history of navigation simulator application in China, introduces the functions, activities and other relevant background of China's national authorities and academic organizations which made great contribution to the successful maritime education and training with the navigation simulator and technical development of the navigation simulators, describes the development of the design & manufacture of the navigation simulator in China's maritim universities and research institutes.

Ever since the introduction of the first radar and navigation simulator from Norway in 1980, China's maritime institutions have progressively adopted the modern maritime education and training (MET) approaches with the navigation simulators. With the rapid development of the modern navigation and simulation technology, the navigation simulators have been broadly used in all maritime institutions in China, playing an increasingly important role in the MET in China.

At the same time, China's maritime institutions and research units have made great progresses in the research, design & manufacture of various kinds of the navigation simulators as well. Apart from a few of the ship handling simulators introduced from abroad, a great variety of domestically produced navigation simulators have been put into use in most maritime institutions in China nowadays.

1. Firm Leading Roles of China's National MET Authorities

The authorities of the Chinese Government have consistently attached great importance to the appropriate administration of the MET with the navigation simulators for the seafarers in accordance with the STCW conventions of the IMO as well as the national practical situation and needs. The national MET authorities in China are related to two important Bureaus in the national Ministry of Communication and Transportation.

1.1 The Bureau of Maritime Safety Administration

Apart from the administrative work and supervision of the traffic safety over the national waters and preventing pollution from ships, the Bureau of Maritime Safety Administration

also has the particular responsibilities for the MET around country. In fact, this bureau is most important authority for the MET in China.

Starting from the end of last century, The Bureau of Maritime Safety Administration has, in accordance with the provisions and requirements of STCW78/95, established a complete legal system for fully implementing the Convention by adjusting and amending the existing rules and regulations and compiling new regulations for supervision and control of training, certification and watchkeeping of the seafarers in China.

To meet with the new requirements of STCW95 Convention and to enhance the practical techniques of the captains and deck officers, the original regulations and the training program, curricula for Radar and ARPA (Automatic Radar Plotting Aid) simulator training has been revised. And there are certain new regulations for the details of the required training facilities, the technical specifications of the simulators and the qualification of the instructors have been issued in order to ensure the training quality.

For example, the Bureau of Maritime Safety Administration has issued the mandatory regulations for the captains and chief officers working on board larger ships (DWT 80,000 T and above or Loa 250 M and above). They have to take part in a special training course of "Large Vessel Manoeuvring and Operation" as per the "Regulations on Special Training and Certification for Manoeuvring of Large Ships for Seafarers of the People's Republic of China" issued in 1997. To insure the quality of this training course, the Bureau of Maritime Safety Administration has established strict rules for issuing the official training permit to the maritime institutions, as this course could only be offered at some of the marine universities which are equipped with the full mission ship handling simulators.

1.2 The Bureau of Education and Science

The Bureau of Education and Science used to be fully responsible for all the administrative work of the maritime institutions around the country. Following the reform of the national education system, the administrative work for the most of the maritime institution has been shifted to the local government.

However, this bureau has still played a very important role in the development of the national MET work. Together with the Bureau of Maritime safety Administration Bureau, it has made great contribution to the MET work with the navigation simulators in order to meet with the needs and requirement for the implementation of STCW95 Convention at the end of the last century.

In order to improve the quality of practical techniques training, the Bureau of Education had taken two main steps. Firstly, it has supported the research work for reforming the navigation simulator training courses and revising the training program and curricula. Secondly, it has encouraged some principle maritime universities to set up the research groups to design and manufacture navigation simulators by their own technical forces.

This bureau had invested a large sum of budget to the maritime universities in Shanghai

and Dalian for the research projects of self-design & manufacture of the navigation simulator. It has also supported the maritime universities to send representatives to take active part in the international academic activities (attendance of the international conference about the MET with navigation simulators) and organize the national academic seminars for the navigation simulators training and manufacture (establishment of the National Workshop of MET with Navigation Simulator).

The aforementioned work which has been done by above authorities has greatly promoted the development of the navigation simulator training, design & manufacture work in China's maritime institutions. Another highly important factor for the successful development of navigation simulator training, design & manufacture work in China is the establishment of the National Navigation Simulator Education and Training Workshop, which has contribute a great deal for the national MET with the navigation simulators.

2. Great Contribution of the National Navigation Simulator Education and Training Workshop to MET in China

2.1 Firm Supports from the National MET Authorities

As previously mentioned in this paper, with the help from the Bureau of Education and Science of the Ministry of Communications and Transportation, some maritime universities in China have sent their representatives to participate in the International Navigation Simulator Lecturers' Conference (INSLC) since early 1988. Moreover, the representatives from Shanghai Maritime University, Dalian Maritime University and other institutions have played important roles in the organization of the national academic activities in China after attending the conference of INSLC. Supported by the Bureau of Education and Science and the Bureau of Maritime Safety Administration, the National Navigation Simulator Education and Training Workshop was established in October 1988.

The higher rank officers, such as the Deputy Chief of the Bureau of Education and Executive officers from the Bureau of Maritime Safety Administration have often attended the national seminars organized by the Workshop since its foundation. The local Maritime Safety Administration Bureaus in China have also sent their officers or representatives to attend the seminars held in their regions. Their participation has supported seminars and provided some guidance to the activities of the Workshop, which could obtain very useful ideas and suggestions from the instructors of the workshop for their decision-making about the MET with the navigation simulators as well.

2.2 Active Participation in Navigation Simulator Academic Activities both at Home and Abroad

The Workshop has also received firm support and help from the maritime institutions all over the country. Up to 2010, there have been 21 national seminars (annual meetings)

organized on the MET with simulators in various maritime institutions in China. This means that the Workshop organized the national seminars annually from 1988 to 2010, except the year 2003 due to the problem of the SARS in China. Recently the 21st seminar had been just finished at Dalian Maritime University and the 22nd seminar of the national workshop will be held at Jiangsu Maritime Institute in October 2011. For detailed information about these national seminars, pleases see the following table.

At the same time, the members are positively taking part in the international academic activities about the MET with the navigation simulator. Apart from attending each of the INSLC conferences, they have organized two of these conferences in the mainland of China. They are the 8th INSLC was organized and held at the Shanghai Maritime University successfully in 1994, and the 16th INSLC was organized and held at the Dalian Maritime University successfully this July (2010), together with the 21st national seminar. Meanwhile, all the participants who attended the conference of INSLC would give a presentation for explaining their impression and experience after attending the conference at the national seminar so that the colleagues working with the navigation simulators in China could get the latest information about the development of the MET with navigation simulator in the world.

All these national and international academic exchange activities of the Workshop have promoted the work for implementing the relevant conventions and regulations, strengthening the cooperation and exchange between maritime institutions both at home and abroad, and consolidating the ties between the competent authorities and maritime institutions.

As a matter of fact, now all the maritime institutions in China have offered various navigation simulator training courses for the seafarers and their students, among which the most popular training courses with the navigation simulator is the proper use of the RADAR & ARPA courses. The ship handling simulator training course and some other special courses, such as search and rescue, prevention of pollution are mainly offered by the maritime universities or some seafarers training centers fitted with advanced navigation simulators.

Table 1. Seminars Organized by National Navigation Simulator Education and Training Workshop

No.	Time	Sponsor	Statistic Numbers		
			Participants	Inst. & Units	Papers
1	1988.10	Dalian Maritime University	17	7	9
2	1989.11	Qingdao Ocean Shipping Mariner's College	19	9	13
3	1990.10	Jimei University	28	13	17

4	1991.11	Shanghai Maritime University	29	15	19
5	1992.05	Qingdao Ocean Shipping Mariners' College	28	11	12
6	1993.10	Dalian Maritime University	35	12	13
	1994.08	Shanghai Maritime University (Held the 8th INSLC in Shanghai)	52	40	29
7	1995.09	Dalian Maritime University	30	13	21
8	1996.06	Ningbo University, Zhejiang International Maritime College	33	15	17
9	1997.05	Zhejiang Transportation College	39	21	22
10	1998.06	Nantong Shipping College	44	21	23
11	1999.06	Qingdao Ocean Shipping Mariners' College	42	21	21
12	2000.06	Dalian Maritime University	51	23	25
13	2001.07	Wuhan University of Technology	54	24	22
14	2002.06	Shanghai Maritime University, Shanghai Maritime Academy	72	26	25
15	2004.09	Wuhan University of Technology	56	25	23
16	2005.09	Qingdao Ocean Shipping Mariners' College	45	22	25
17	2006.09	Guangzhou Naval Academy	40	27	22
18	2007.10	Zhejiang International Maritime College	57	25	31
19	2008.11	Jimei University	50	17	27
20	2009.10	Nantong Shipping College	54	23	21
21	2010.0	Dalian Maritime University	73	35	27

	7				
The 22nd National Seminar will be held at Jiangsu Maritime Institution in October 2011.					

2.3 Significant Role in MET and Design & Manufacture of Navigation Simulators in China

After establishment of the national workshop for the MET with navigation simulators, the members of the Workshop discussed the details of the various programs and contents of the navigation simulator training courses, and exchanged experiences about the preprogramming and running of simulator exercises and the methods about the briefing and debriefing at each of the national seminars.

Entrusted by the Bureau of Maritime Safety Administration, the Workshop has added all the preparation work of the national program and syllabus for Radar & ARPA and ship handling simulator training courses, and has compiled and amended the training guidance books and teaching materials in accordance with the national and international convention and regulations.

The Workshop had also made some suggestions about the technical specifications for the Radar & ARPA, ship handling and other simulators. In consideration of relevant requirements of the STCW95 Convention, especially for the insurance of the training quality using the proper facilities of simulators, the experts of the Workshop joined the research projects which were set up by the Ministry of the Communications and Transportation for the "Standardized Technical Specifications of Radar, GMDSS and Ship Handling Simulators separately in China". These technical specifications have been officially issued and all navigation simulators made in China should meet the technical specifications issued.

To ensure those maritime institutions can fitted with enough simulator training facilities, the Workshop has encouraged the teachers and researchers from the universities and scientific technical companies to carry out the research work for design & manufacture of the various navigation simulators. It has also provided the opportunities and platform for them to exchange the information and experiences about the design & manufacture of the various navigation simulators by their own technical forces. It has also contributed a lot for the coordination of some research projects in China.

3. Rapid Development in Design & Manufacture of Navigation Simulators in China

The maritime institutions in China introduced some Radar & ARPA, Navigation Aids, Ship Handling and GMDSS simulators from Norway, Japan, the United Kingdom and

Holland from the 1980s to the early 1990s. These navigation simulators had played a very import role in the navigation simulator training work at that time. Apart from the expensive prices of the navigation simulators from abroad, the inconveniences and high costs of the maintenance & repairing work, the problems for updating the original software disturbed the proper application and update of these training facilities. China's maritime institutions have to solve the above mentioned problems by themselves and to manufacture more advanced navigation simulators to meet the requirements and needs of the development of the national MET work.

3.1 Design & Manufacture of Navigation Simulators by Maritime Institutions

The research project for self-designing & manufacturing of navigation simulators was started by Guangzhou Naval Academy in the middle 1980s. The first national made RSS-80 Radar & ARPA Simulator with two ownships had been put into use for training seafarers in 1998. Dalian Naval Academy also carried out the research work to build up the radar & ARPA simulator and Ship handling simulators at that time. Their ship handling simulator with the technology of Laser Vision System had been formally used in the early 1990s.

Similarly, Shanghai Maritime University also started to research and design ship handling simulator since 1989. After several years' efforts by the experts and teachers of the Nautical Technology Research Center at this university, the first simulator with a Model of SMU-I had been put into use in 1992. In 1994, the second generation was completed just before the opening of the 8th INSLC at this University. A model of SMU-IV integrated ship handling simulator was completed in 1996. The Radar & ARPA Simulator made by this university was also used for seafarers training at the same year. In the following years, Shanghai Maritime University had developed some new navigation simulators together with Korea Maritime University. Recently, Shanghai Maritime University had designed and manufactured their latest full mission of ship handling simulator with 360 degree view angle and 3 D (stereoscopic) vision display system. This full mission simulator, with its diameter of the project screen up to 20 meters, is the largest size of its kind in the world. The external outlook and internal arrangement of ownship (simulated bridge) for this full mission simulator can be referred to in Fig.1 and Fig.2.

Figure 1. External Outlook of

Figure 2. Internal Arrangement of

Dalian Maritime University has also tried a lot for the development of their own navigation simulators. The first ship handling simulator was developed and put into use in 1994. Since then, it has been updated continually, with the virtual reality technology used with the six free dimension dynamic mathematic ship models in recent years. Now its latest model has been obtained the attestation from the DNV and has been equipped in the Singapore Navy. The external outlook and internal arrangement of ownship (simulated bridge) for the latest model of the full mission simulator can be referred to in Fig.3 and Fig.4.

Figure 3: External Outlook of

Figure 4: Internal Arrangement of

At the same time, Qingdao Ocean Shipping Mariners' College established a research group for the design & manufacture of QOMC-90 Radar & ARPA Navigation Simulator at the end of the last century.

Besides the development of the Radar & ARPA navigation simulator and ship handling simulator, the GMDSS simulator had been developed and manufactured by Dalian Maritime University, Shanghai Maritime University and Jimei University. The Liquid Cargo Handling Simulator had been developed jointly by Dalian Maritime University and a Maritime Research Institute in Dalian. Nowadays, there are more than 40 maritime institutions, training centers and scientific education bases, both at home and abroad, which have been equipped with various navigation simulators manufactured maritime universities in China.

3.2 Design & Manufacture of Navigation Simulators by the Maritime Technical Companies

Apart from the above simulators designed and manufactured by the maritime institutions, the maritime technical research institutes and companies have also made great effort to design & manufacture various navigation simulators in recently years.

The first Radar & ARPA simulator developed by the maritime technical research institute is model KTS-88, designed by Shanghai Ship & Shipping Research Institute which was originally under jurisdiction of the Ministry of Communications in 1988. Shanghai Honghao

Science and Technology Co. Ltd, a privately owned high and new technical enterprise which was found in 1993, had played an important role in the design & manufacture of the navigation simulators for China's maritime institutions, especially for the maritime professional colleges. Starting from the production of MET Software for Computer-assisted Instruction (CAI), now this company has manufactured the systematic 2H-100 and 2h-200 navigation simulators, such as Radar & ARPA Simulator, Navigation Aids Simulator (GPS, ECDIS), GMDSS Simulator and Integrated Navigation Simulator.

Another technical company involved in the design & manufacture of the navigation simulator in China is Asia Simulation Control System Engineering Co. Ltd, located in Zhuhai, a city near Macao. It is a large national enterprise, which specializes in the development of research and control simulation system. This company, which used to produce the aviation & aerospace and electronic power simulators, has shifted to produce the navigation simulators. Its simulation technology and products for navigation pilot simulator and engine-room simulator had been used in some maritime institutions in China.

The rapid development of the design & manufacture of navigation simulators by the maritime institutions and technical companies have met the needs of the national MET in China. According to recent statistic data, there are more than 100 navigation simulators equipped in China's maritime institutions, among which more than 80% are national made.

4. Conclusion

To meet with the increasing demand of the international and national shipping industry, China's maritime institutions have a long way to go. Due to the huge requirement of crew members both at home and abroad, more qualified seafarers and students have to be trained for the shipping personnel market. It means that the Chinese maritime institution should continually attach great importance to and keep substantial development of the MET with navigation simulator in the future. Moreover, the national Workshop should cooperate enthusiastically with the competent authorities for the MET work, provide related information and strategy consultation to the Authority, and strengthen the relationship with INSLC for valuable experiences form abroad. It is sure that the broad application and advanced design & manufacture of the navigation simulator will continually enjoy brilliant prospects and make more contributions to the future MET in the world.

5. Author's biography

Fang Quangen, Professor, Director of Navigation Simulator Training Centre of Shanghai Maritime University in China. He was graduated from Shanghai Maritime University in 1976 and working as a teacher at this university in the same year. He has been in charge of the training work with navigation simulator since he completed the "Simulator Instructor

Training Course" at the Nautical College of Warsash, Southampton, UK in 1985. He finished his the postgraduate study course of "Maritime Education and Training (Nautical) Course" at World Maritime University during 1990-1991 in Sweden. He spent half year to join the research on maritime risk assessment and control at the Liverpool John University, UK as a senior visiting scholar. Professor Fang is the steering committee member of the International Navigation Simulator Lecturers' Conference (INSLC) since 1990 and now he is the Vice Chairman of this international academic organization. He is also the Vice Chairman and general secretary of the Chinese Navigation Simulator Education and Training Workshop.

MAAP'S IT Aided Competence Management System Ensuring Quality in Maritime Education and Training

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Abstract

Considering a number of ship accidents that were attributed to human error and great demand for marine officers, competence on-board ship is an imperative requirement of STCW and most importantly the shipping industry. Likewise, sponsors of MAAP cadets require demonstration of competence during their shipboard training and eventually when they have formal voyage contracts. Hence, to set a bar higher than the Philippine regulatory requirements and STCW requirements, MAAP in cooperation with DNV SeaSkill signed an MOA to develop an IT Aided Competence Management System (IACMS) mapping the necessary competence of both Deck and Engine Watchkeeping Officers. This paper shall present the system's framework, development stages, and the effects of the system on the quality of MAAP's Maritime Education and Training.

The underpinning education theory of IACMS is Biggs' (1999) Constructive Alignment, which promotes a curriculum or course design wherein the learning activities and assessment tasks match with the learning outcomes that are intended in the course. With the integration of information technology, MAAP gains the edge of having an easier analysis of assessment results and training needs of its cadets.

Hence, the paper aims to meet the global challenge of having a safe and environment friendly merchant marine transport thru an IACMS that will ensure the quality of our graduates that will man vessels in the future as officers. Furthermore, the paper may serve as an inspirational reference to other maritime institutions to adopt or improve their own competence management system benefiting the shipping industry as whole.

Keywords: Competence, Competence Management System, Constructive Alignme

1. Introduction

STCW connotes standard of competence of seafarer including requirements for trainers and assessors (IMO 1996). Even in the new 2010 revision of STCW it is evident that it expanded the competence requirements not only for the officers but as well the able seafarer. However, during the past years, significant numbers of accidents and incidents relating to maritime transport have occurred. According to Filor (2003) incidents that involved ships such as Oceanic Grandeur (March 1978), Herald of Free Enterprise (March 1987), Dona Paz (December 1987), Exxon Valdez (March 1989), American Trader (February 1990), Haven (April 1991), Neptune (February 1993) resulted to loss of life, pollution and loss of property. The European Maritime Safety Agency in its publication of Maritime Accident Review 2008 has identified 670 accidents and 82 seafarers' lives were lost around EU waters as categorized into Sinking, Grounding, Collision/Contact, Fire/Explosion and other significant types. There was a decline from 715 accidents in 2007 but an increase from 505 accidents in 2006. It was surmised that there were a decline of accidents but increase in loss of lives from 76 casualties from 2006.

Most the accidents were attributed to the master and/or crew as human error for over 80% of all accidents (Filor 2003). Analysis made by the Tavistock Institute of Human Behaviour concluded that over 90% of all collision and groundings and about 75% of contacts, fires/explosion was because of human element after studying UK shipping incident reports. Why is it that in spite of having the STCW convention and code and other regulations with a couple of revision, there are still a large number of accidents? Where is the competence expected of each officer and able seaman?

The fact is STCW defines the minimum competence requirements as a tool for guidance and specification of the qualifications required to work on board a ship. Unfortunately, many qualifications alone do not always ensure competency in practice. The competence levels of seafarers are also determined by motivation, teamwork, experience, interpersonal skills, overall organization capabilities and commitment (Green and Jakobsen 2006).

It is for these reasons that MAAP have forged partnership with DNV SeaSkill to come up with an IT Aided Competence Management System (IACMS) that shall go beyond STCW requirements. MAAP as a provider of Maritime Education Training, wants to ensure that the competence being taught the cadets is what the industry needs. The IACMS includes Society of International Gas Tankers and Terminal Operators (SIGTTO) standards, DNV Competence standard, and Tanker Officer Training Standards (TOTS). The Information Technology part of the IACMS use a software called Crew Performance Evaluation and Training System (CrewPETS) that contains all the competence that needs to be learned, performance criteria, training needs and gap analysis. This software is installed in the campus and training ships of the sponsors.

2. Literature survey

They say that "experience is the best teacher". This is founded on the constructivism theory (Piaget 1950) that human beings learn thru experience that leads to the formation of general concepts or constructs that are models of reality (Fry et al 2004) that fit new understanding and knowledge extending and supplanting prior learnt schemata. This experiential learning (Kolb 1984) whether in cognitive, affective, interpersonal or psychomotor domains leads to individual transformation. Hence, competence can be developed in a process of effective teaching and learning. Biggs' (1999) constructive alignment theory emphasized that intended learning outcomes (ILO), teaching/learning activities (TLA) and assessment tasks (AT) needs to be aligned or be in harmony for a maximum consistency to make teaching more effective (Biggs and Tang 2007). This means that TLAs and ATs should be designed to meet the ILOs (Figure 1).

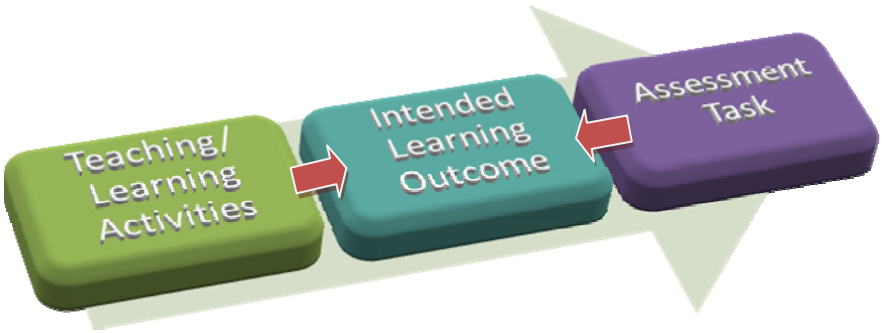

Figure 1. Constructive Alignment Theoretical Framework (Biggs 1984)

In order to make this alignment work, a system is needed to link them together. Competence Management as a systematic approach according to Durgin (2006) " is a key to aligning human capital assets with business strategy to create value for organizations and drive their performance forward in a competitive talent market. " BEST (**B**uilding talent **E**nterprise-wide, **S**upported by the organization's leaders fostering a **T**horough learning culture) awardees, as noted by the American Society for Training and Development (ASTD), are organizations that successfully strategized aligning of their business strategies with competencies that have been developed through competency planning individual learning link to organizational performance.

Since individual performance is on the focus, Competence Management Systems (CMS) are related mostly on Hu man Resource Management. Others term this system as Skill Management that is defined as the management of the qualifications, experiences and knowledge of the employees. This means the allocation of appropriate skills at the correct place, at the right time, at optimal cost (Kreitmeier et al 2000). In Beck's (2003) paper

regarding their pilot project of computer aided Skill Management System of Putzmeister Inc. at Germany, he identified success factors as acceptance strategy, good co-operation among workers, human and organizational resources, technical facilities, and computer literacy.
CMS rooted on Learning Management System and heavily associated with Knowledge Management. CMS also provides a roadmap aiding organization develop their talent pool (Durgin 2006). The IT-Supported Competence Management in Ericsson Norway with more than 140 countries was studied by Hustad et al (2003) revealing potential benefits like knowledge networking and "communities of knowing' and challenges such as designing a competence framework, tension between global standardization and local practices, and gaining commitment. Furthermore, Berio and Harzallah (2005) have organized CMS into four kinds of processes such as competence identification, competence assessment, competence acquisition, and competence usage.

Webster (2002) has defined competence as the quality or state of being functionally adequate or of having sufficient knowledge, judgment, skill, or strength. The task at hand for us as an academic institution is to enable our students to attain the level competence required as mandated by STCW, national administration and most importantly the industry. According to Capt. Almeida (2007) of Anglo Eastern Ship Management, STCW 95 amendments covered three important areas such as responsibilities of shipping companies, uniform standards of competency and methods of demonstrating competency with the criteria for the assessment. However, even competencies were identified per functions and levels performance standard for each competency is lacking. Therefore, there is an acute need to create proper assessment in order to measure in detail each individual performance in compliance to a standard for support, operational and management levels.

That is why a competence management system is important. The training institutes, shipping industry, and administration need to hurdle this herculean task of writing the performance objectives, measures and standards that will ensure compliance to the STCW and other standards. In order to achieve this goal, shipping stakeholders need to push and improve competence management capabilities (Green and Jakobsen 2006). Teekay Shipping was the frontrunner of this system with its own SCOPE (Seafarer Competence for Operational Excellence) competence management system that has gained DNV certification in April 2004 in accordance with TOTS. SCOPE was designed by Teekay to improve seafarers individual performance by addressing needs which have identified through a full assessment of competencies and progress their career development. Its LNG training section follows after two years in compliance with SIGTTO (MarEx Newletter 2007). John Adams, MD of Teekay Shipping (Glasgow) Limited remarked: "What is all hangs on is continous professional development. It's a living system. It is constantly being managed, adapted and tweaked" (Tradewinds 2009). "Having its own 'SCOPE' system already in place has put the tanker operator in the frontline of quality" (Guest 2009).

In 2008, Thome Ship Management (TSM) with more than 100 vessels was the first Ship Manager in Asia to implement class-endorsed crew competence management system. The system enables both organizations to systematically examine crew tasks, work tools, operating environment, officers' mental well being, training and experience, communications across different vessel types. Capt Bjorn Hojgaard, TSM Managing Director, said: "The shortage of seafarers puts pressure on quality so it is increasingly important to be on top the competencies in the pool, and by stretching our training dollar investment, it means MAAP can provide more focused training where gaps have been identified". (Shipmanagement International 2008). After a year, NYK Shipmanagement with 104 ships has become the first Asian ship manager to get DNV SeaSkill Certification for its Competence Management System (Seatrade Asia online Maritime News 2009). Hemmant Pathania, NYK MD, said that their company has taken the three-year certification process just to help make seafarers feel safer and also enable the company, through being SIGTTO and TOTS compliant, to work with the oil majors and hope others will follow (Daily Fairplay News 2009).

3. MAAP's IT-Aided Competence Management System

Most of the literary works surveyed on competence management were practically about human element of each organization and their thrust to harness talents to its full potential and usage. MAAP version of CMS is concentrated on the competence of its students as Watch Keeping Officers (WKO) and Watch Keeping Engineers (WKE) and not of its employees.

The project was conceived last February 2009 wherein issues were raised at a Forum conducted by DNV. Specifically, the issues noted were the need too identify real training needs of its external clients (Ship owners & managers) and the Specific Competence Standards, assistance in developing right competence-based courses that will satisfy our clients, assistance in acquiring clients' evaluation reports on each trainee from MAAP, and enhance/strengthen assessment system in terms of competence development relevant to the needs of our clients.

Eventually on 23 July 2009, MAAP (VADM Eduardo Ma. R. Santos AFP (Ret.), President, MAAP) have signed an agreement with DNV SeaSkill – Asia (Mr. Amit Ray, GM, DNV SeaSkill Asia) to develop a Competence Management System with IT support for WKO and WKE. The singing was witnessed by Mr. Tony Leosala, Country Manager, DNV, and Mr. Michael A. Amon, Project Manager.

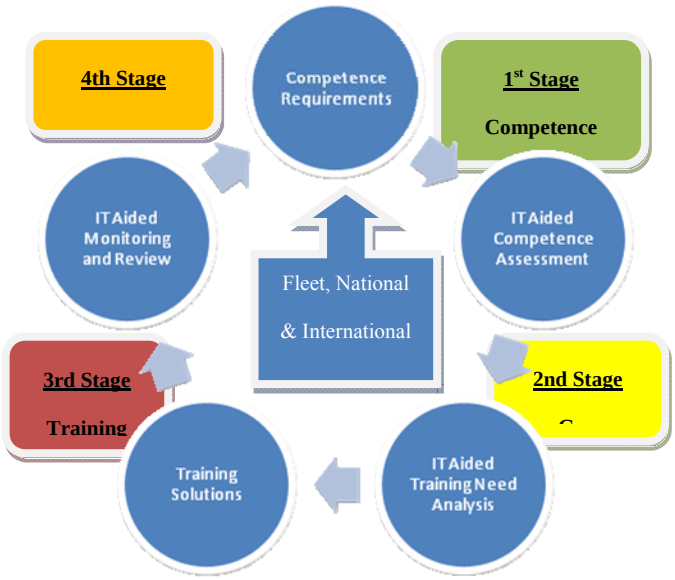

Figure 11. MAAP IACMS Framework

3.1 MAAP IACMS Framework

The IACMS Framework as shown in Figure 2 provides high-quality competence management circle to ensure effective structure system, and foundation for continued improvement (Green and Jakobsen 2006).

The box in the middle are the inputs to develop the competence which consist of Fleet specific Key Performance Indicators (KPI), IMO Conventions (STCW) & National Legislation, Ship in Operations (SIO) Incident & Accidents (50,000++ survey/yr), and Industry Standards (SIGTTO, TOTS, SOLAS, MARPOL, Loadline, TMS, Safety, Security & Environment, IACS, Class).

Competence Requirements consist of (re-)defining Competence Standards (CS) that can be used to redesign MAAP course syllabi and to align assessment systems. The CS in a way serves as the ILOs because they are MAAP objectives for its graduates to achieve. Performance Criteria (PC) based on the CS will be used in the IT Aided Assessment which is based on the CS hence Biggs (1999) Constructive Alignment Theory will come into realization.Weakness or areas for improvement are identified using the software for Training Needs Analysis (TNA) and provision of Training Solutions are more likely serves as a Corrective Actions (ISO 9000:2005) to ensure they meet the CS intended for them.

The last circle basically means review reports to further enhance the system. However, According to Green and Jakobsen (2006) internal audit is necessary to be established and implemented to produce actions in the system improvements affecting business goals, KPIs, non-conformities and recommendations.

Figure 12. MAAP IACMS Development Stages

3.2IACMS Development Stages

The project has three stages as shown in Figure 3 wherein an initial data gathering last 23-24 of July and data gathering last 12-14 August 2010 were conducted by DNV Project composed of Capt. Sanjeev Soni, Engr. Christopher Hoo, and Engr. Crystal Wong. Stage 1 primarily is the development of review CS and PC involving DNV and MAAP personnel. Stage 2 is the creation of Multiple Questions, Simulator/Laboratory and Oral marking sheets which are all based on CS and PC. Stage 3 involves the integration of CS and PC to Crew Performance Evaluation and Testing System (CrewPETS) and used it as a tool in the database buildup of the competence assessment, TNA and monitoring. During this stage the program have been installed and the concerned MAAP personnel have been trained on how to use the software. Consequently, all areas are to be updated annually to make it relevant and current.

3.3 Development Approach of CS & PC for WKO and WKE

The difficulty posted by Capt. Almeida (2007) on his critical analysis of STCW have been addressed by our DNV SeaSkill partner with a vast database thru breakdown of the various needed competence into specific requirements with criteria that will meet each competence.

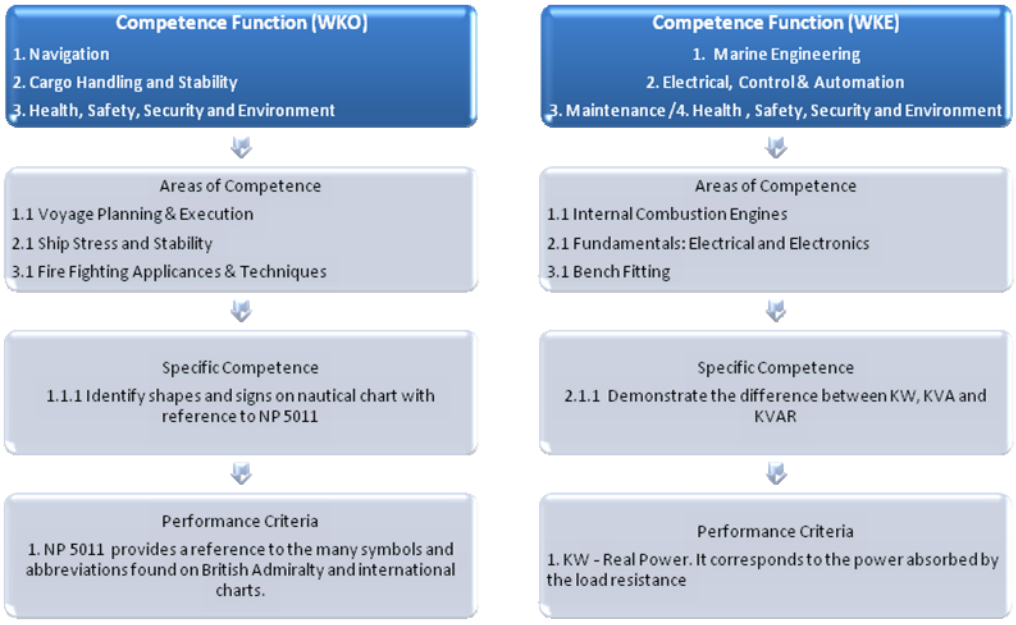

Figure 13. CS and PC Breakdown Examples

The PC and CS were designed after STCW's functional approach as Competence Function which were translated into Areas of competence relevant to the rank (WKO or WKE) of about 19 areas for WKO and 35 areas for WKE in total. These areas again were translated into Specific Competence. Furthermore, the assessment of each specific

competence has its own set of criterion to meet. The criterion intended to aid the consistent measurement of competence gaps of the trainee, effective TNA, effective learning or training tool as it provides best industrial practices and reference with regards to the specific competence being assessed. Figure 4 shows the actual examples of how the competences were cascaded. The assessment designed can be done orally, using simulator or laboratory. Moreover, all of these data are supported by software which are designed in the MAAP intranet and have interoperability or linked with MAAP training ship.

4. Target Area

The IACMS targets candidates joining ship as WKO/WKE (graduating students) and candidates joining ships for their on-board placement and/OR training as cadets (3rd Year cadets). Specifically, the application of the CS & PC shall be carried out as follows:

a. End of Year 2:
   - Use the competence elements marked as "C" (Critical) to assess the candidates of their competence
   - This shall aid the evaluation of the candidates to a base line criteria which is considered essential to be met, prior boarding the ship as a cadet

b. End of Year 4:
   - Use the entire standard to measure the competence of the candidate, prior joining ship

5. Results

Table 1 shows the number of specific competences per rank with the type assessment they can be assessed and critical areas the needs to be assessed. The number shown excludes the number of criterion under each specific competence that may cover of about 4-15 detailed performance criteria. This means WKO will approximately have more than 612 (153 x 4) for critical competence and more 1396 (349 x 4) for total criteria for the whole rank. For WKE the number would more than 628 (157 x 4) for critical and more than 2724 (681 x 4).

Table 1. Total Number of Specific Competences

Rank	Simulator Assessment	Laboratory Assessment	Oral Assessment	Critical	Totals
WKO	106	116	236	153	349
WKE	171	465	398	157	681

5.1 Analysis and Discussion

Indeed, it was a breakthrough for MAAP to come up with actual shipping industry, regulatory and statutory competence requirements that can be imbued to our cadets to ensure that upon graduation, MAAP cadets are off top caliber as WKO and WKE. Having CS as our ILOs and PC as our ATs, IACMS paved the way for MAAP to implement Biggs (1999) constructive alignment to our curriculum and syllabi which is more applicable to adult learning. The missing link is the TLAs wherein in Figure 2, Training Solutions design was more likely of reactive. Based on the literature survey, most IACMS were designed for employees and in shipping this refers to crew where training and competence assessment can be done because they stay in the organization as long as they are tenured. Implementing IACMS for students in a training institution is a different story that needs another approach.

Seeing this flaw on the system, MAAP added in the competence circle the development/revision of course manuals and course delivery to match and justify the validity of the assessment to be given. The most crucial part of the IACMS is the transfer of competence through TLAs which is the third component constructive alignment making student learn through experience (Kolb 1984). With good TLA design, MAAP encouraged critical thinking, safety culture and gearing up from the plane of factual knowledge to metacognitive knowledge domain (Anderson & Krawthwohl 2001). To address the issue MAAP has created a pilot test team that shall redesign 23 course manual for BSMT and 27 course manuals for BSMarE, and develop simulator scenarios and laboratory exercises integrating CS and PC. On top of that MAAP has tapped DNV to conduct Training for Trainers and Assessors with an examination making them DNV certified last 1-3 June 2010 to fully equip our faculty on the task.

With the vast number of standard and criteria to be assessed extensively, a number of challenges to the project surfaced. Can the assessment be done? Who will do the assessment? Are there enough facilities and manpower? How can competence be ensure or retrain cadets if the test was given at end of the year? These were the challenges MAAP have to hurdle. Having 250 – 500 students to be assessed for 349 or 681 competence is really a tall order to follow. What MAAP has done is to cascade each specific competence per subject to make the assessment to spread out across the curriculum. Assessment will be done during term examination per semester, during shipboard, and comprehensive subject. For assessor MAAP shall tap maritime assessors from other department, within the academy and perhaps invite external examiners, to address lack of assessors. There were only few equipment for procurement but management was keen on giving its full support. Since the assessment strategy was cascaded as formative assessment it resulted to formative feedback to students making them reflective practitioner (Moon 1999) by learning from their mistakes and experiences and schedule mentoring program for those who fall short in the examinations.

Beck's (2003) identification of computer literacy as one of success factor in an IT aided system has been confirmed because assessors, project manager, and academic staff need to be to operate CrewPETS. MAAP also decided to hire temporary encoders to supplement manpower for the project and do data entry. As to date MAAP is pilot-testing the ship version of CrewPETS on training ship and would expand its use, if ship owners would allow the installation of IACMS on board their ship.

6. Conclusion

MAAP's IT Aided Competence Management System, as the first in the Philippines, is profoundly set the bar higher in ensuring Quality in Maritime Education and Training for breaking the barrier and leaping out of bounds of STCW requirements and zooming into the real industry needs, relevant shipping industry reports, regulatory and statutory standards, and new technology as part of its core service provision. Founded on effective educational theory and practice, IACMS break the grounds of overhauling the teaching and learning process of the institution with the identification of specific competence needed to be performed as WKO and WKE. Beck's (2003) identification of success factors were also the issues that MAAP has encountered, resolved and hoped to be solved. Most competence management systems were designed for employees and greatly improve business performance that MAAP has tweaked to fit to its own educational system. MAAP as a training institution have spearheaded this new approach to education and training and hoped to be the first CMS Certified MET Academy in the Philippines and be an inspiring model to the global MET organizations, and associations MAAP hopes to contribute in its share in eliminating or lessening loss of life, property, and environment at sea.

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Discussion on Characteristics and Manoeuvring Methods in Polar Region

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Abstract

Nowadays, polar navigation has become routine to a rising number of vessels operating in and through such high latitude parts of the world. However, those ships as well as mariners are not all well prepared for their expedition.Some may be ill prepared to navigate and respond to the extreme and highly variable environment conditions in the southern Ocean. There is no clear consensus, however, about weather the frequency of icebergs, and their danger to shipping, will change with global warming. In this article, the authors will talk about the navigation routes and characteristics of polar region, the supporting measures of ship in polar region and the manoeuvring methods shall be handled and adopted properly by the mariners.

Key words: polar region; characteristics; supporting measures; ship manoeuvring methods

1. Introduction

The coldpolar regions are found on the far south and north ends of the globe. During the winter the sun never rises and during the summer the sun never sets.The weather is very cold year around. The polar regions were the last places on earth to be explored. There is much debate over the valuable oil and mineral resources available in the polar regions.

The southern polar region is called Antarctica. The ice-covered continent is larger than the United States and is surrounded by ice and water. The total surface area is about 14.2 million sq km (about 5.5 million sq mls) in summer, approximately twice the size of Australia, half as big again as the USA and fifty times the size of the UK.

The northern polar region is called the Arctic. The Arctic is a huge ocean surrounded by land. Its top is frozen and the floating ice is around 16 million sq. km, (greater than the US),

shrinking in summer to 9 million sq. km. As the ice shrinks, open water leads expose the black water.The Arctic marine area includes the Arctic Ocean, the adjacent shelf seas (Beaufort, Chukchi, East Siberian, Laptev, Kara and the Barents Sea), the Nordic Seas (Greenland, Norwegian and Iceland seas), the Labrador Sea, Baffin Bay, Hudson Bay, the Canadian Arctic Archipelago and the Bering Sea.

As the result of global warming, the rapidly melting ice in Arctic has raised speculation that the Canada's Northwest Passage linking the Atlantic and Pacific Ocean could one day become a regular shipping lane. Those routes that has been avoided by commercial ships are now being considered by many shipping companies.

However, navigating in the polar region the vessel will meet with many different kinds of dangers such as hug icebergs, dense fog, huge wind, heavy ice floes and other unexpected serious condition. It requires navigators with unique considerations and knowledges so as to grantee the navigation safety.

The authors of this article took part in the 26th China Antarctic Expedition team and 4th Arctic Expedition team. They worked as officers on icebreaker Xuelong. According to the statistics and materials they obtained onboard, this article will give a brief introduction about the Arctic and Antarctic routes as well as a discussion on manoeuvring methods in polar region.

2. Navigation routes and characteristics of navigation in polar region

2.1 Navigation routes

The oceans that are in the polar regions are a bit different from other oceans on Earth. There is often sea ice at their surface, especially during the winter months. And those chilly waters are home to some unique marine life.

2.1.1 Arctic Ocean

Arctic sea routes includes Northern sea route and Northwest passage. Sea routes along the edges of the Arctic ocean, or rather along the coasts of Northern Canada and Russia, holds potential for decreasing the number of days in shipping goods from the Pacific to Atlantic coasts in Europe and North America, and vice versa. In addition, this could provide a means to transport natural resources, such as oil and gas, extracted in the Arctic. Currently these routes have not been possible to use this, due to the ice conditions, but with decreases in ice - due to climate change - this could provide a new possibility. In addition, this would mean increased risk for the sensitive wilderness areas along these coasts, with oil spills and pollution. Please note that Northern Sea Route was previously known as Northeast passage.

The Northern Sea Route is a shipping lane from the Atlantic Ocean to the Pacific Ocean along the Russian Arctic coast from the Barents Sea, along Siberia, to the Far East. The route lies in Arctic waters and parts are free of ice for only two months per year. Before the beginning of the 20th century it was known as the North East Passage, and is still sometimes referred to by that name.Several seaports along the route are ice-free all year round. They are, west to east, Murmansk on the Kola Peninsula, and on Russia's Pacific seaboard Petropavlovsk in Kamchatka, Vanino, Nakhodka, and Vladivostok. Arctic ports are generally usable July to October, or, such as Dudinka, are being served by nuclear powered icebreakers

The Northwest Passage is a sea route through the Arctic Ocean, along the northern coast of North America via waterways amidst the Canadian Arctic Archipelago, connecting the Atlantic and Pacific Oceans. From west to east the Northwest Passage runs through the Bering Strait (separating Russia and Alaska), Chukchi Sea, Beaufort Sea, and then through several waterways that go through the Canadian Arctic Archipelago. There are five to seven routes through the archipelago, including the McClure Strait, Dease Strait, and the Prince of Wales Strait, but not all of them are suitable for larger ships. The passage then goes through Baffin Bay and the Davis Strait into the Atlantic Ocean.

2.1.2 Southern Ocean

The Southern Ocean is different. Many mapmakers do not even recognize it as an ocean. The Southern Ocean (sometimes known as the Antarctic Ocean or South Polar Ocean) surrounds Antarctica in the South Polar Region, extending to 60°S latitude. Icebergs can occur at any time of year throughout the ocean.

Reduced sea ice will provide safer approaches for tourist ships and new opportunities for sightseeing around Antarctica and the Arctic.These activities will have important implications for the people, economies, and navies of nations along the Arctic rim. From October 11th 2009 to April 10th 2010, the author took part in the 26th China Expedition team. (see figure 1.)The whole voyage took 182 days along the antarctic coastline with 32,000 nautical miles including 3,241 nautical miles in ice region. Navigating in southern ocean is different from in other areas. Mariners may meet with many unexpected difficulties what will be discussed in this article and great seamanship are required in order to keep safe navigation.

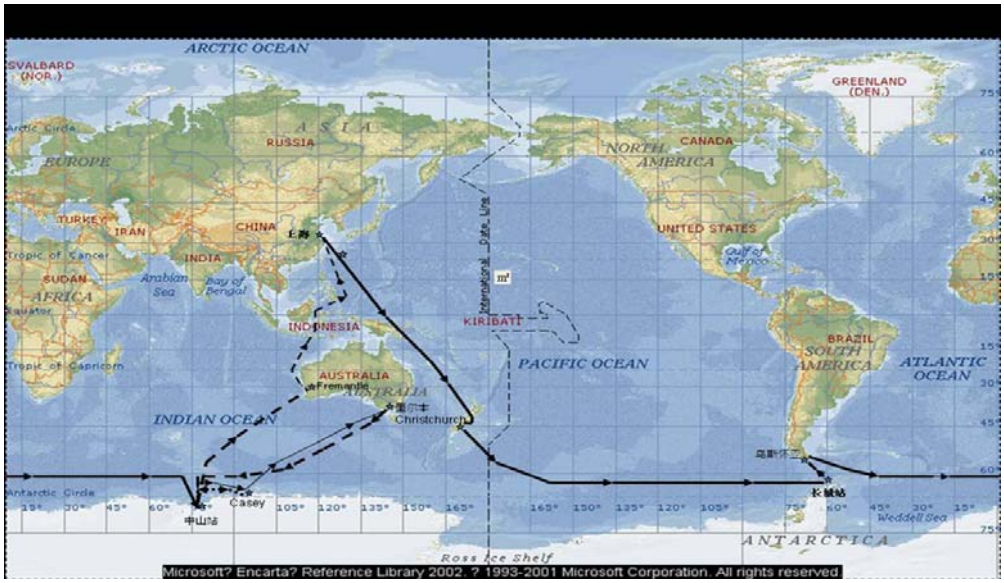

Figure 1. Route chart for 26th China Antarctic Expedition

2.2 Characteristics of navigation in polar region

2.2.1 Main navigation dangers in the Southern Ocean

1) Ferocious winds

Antarctica is well known for its ferocious winds and blinding storms. Its reputation as the windiest and least hospitable continent on earth is well-deserved. Localized blizzards and life-threatening wind-chill temperatures are an ever-present danger. Along the coast, cold dense air flowing down off the ice-cap funnels through topographic channels at great speeds lifting snow high off the ground and reducing visibility to only a few feet. In the interior, inversion winds coupled with the extremely low temperatures have led to many a tragic end to an Antarctic expedition

In recent years, the analysis of weather forecasts of the Southern Ocean shows that the main distribution of Southern Ocean wind can be divide into following categories:

- The Wild Westerlies
- The Coastal (Polar) Easterlies
- On the Polar Plateau
- Inversion Winds
- Katabatic Winds

When the ship encounters with the the huge winds, the following dangers the mariners may meet with:

- The hull will up and down heavily in wave crest and wave through. Occasionally the wave crest hits the middle of the bilge while the fore and aft part expose in the air. This may cause the fracture and deformation of the hull.
- The propeller will race at rough sea and the ship may threatened to capsize.

- The huge wave could wash over the deck and the mooring line may drop into sea and twist on propeller. It is more dangerous when the ship encounters with gale without power.
- The vibration of the full may cause the damage of the welding part. After a while, the welding part may split up and the situation will get worser.

Figure 2. Icebreaker Xuelong in Westerlies

2) Polar ice pack

Polar ice packs are large areas of pack ice formed from seawater in the Earth's polar regions, known as polar ice caps: the Arctic ice pack (or Arctic ice cap) of the Arctic Ocean and the Antarctic ice pack of the Southern Ocean, fringing the Antarctic ice sheet. Polar packs significantly change their size during seasonal changes of the year. However, underlying this seasonal variation, there is an underlying trend of melting as part of a more general process of Arctic shrinkage.

From July 1st, 2010 to September 20th , 2010, icebreaker Xuelong navigated through Bering strait and encountered with floating ice (see figure 3)around latitude 70°N. With the increasing of the latitude, the dimension and thickness of ice packs increase. She sailed in the Arctic ocean for the whole summer and finally reached latitude 88°26'N. The Concentration and thickness of the ice packs were high and the ship moved very slowly.

Figure 3. Xuelong navigating along the ice boundary

3) Iceberg

Large icebergs (see Figure 4)weigh more than 1 million tons (910,000 metric tons), and some are many miles or kilometers long. The biggest ones tower as much as 400 feet (120 meters) above the surface of the ocean. But this is only a small part of the whole iceberg. Only one-seventh to one-tenth of the iceberg's total mass is above water.

Icebergs can be extremely dangerous to ships.There is little human beings can do to control icebergs. It is difficult to destroy an iceberg by blasting, or to steer it into a different course which would take it out of an ocean shipping lane. It is even difficult to approach an iceberg, because the submerged parts may tear open a ship's bottom

Navigating in the sea surrounded by antarctic land, it is dangerous to encounter with icebergs. When ship reaches around 58°S, all kinds of icebergs may appear in front of you.

Figure 4. Icebergs

2.2.2 Main navigation dangers in Arctic Ocean

The problem unique to Arctic Ocean is the dense fog. This grey and dull blanket of damp air is a spooky sight. Ridges, ice pinnacles and ice boulders will emerge out of the fog like ghost ships at sea.

In the Arctic, fog is a major cause of low visibility at sea. It is particularly common in Baffin Bay in the spring and summer and on the Grand Banks at all times of the year. Sea fog, or advection fog, forms when warm, moist air moves over colder sea-water. As the air cools below its saturation point, excess moisture condenses to form fog. This type of fog may cover large areas and may persist for long periods, even under windy conditions, provided a continuous supply of warm moist air is available.

3. Supporting measures for ships in polar region

3.1 Icebreaker construction

Icebreaking ships are a relatively new evolution in the history of ship design and construction. Conventional ships in or near ice-covered waters from the earliest years of recorded history had to do their best to avoid the ice. If they failed, they risked being trapped in ice with the potential loss of the ship and crew due to the extreme pressures and strength of the ice.

The essential approach taken in the more recently revised rules is to specify maximum design loads based on ship-ice interaction models that have been calibrated with full-scale

measurements. The design loads depend on displacement and power and are applied to different structural elements according to pressure-area relationship. Scantling are determined using elastoplastic criteria that permit stresses in excess of yield so that some permanent hull deformation is acceptable.

In continuous running mode, icebreakers break ice by weight. As an icebreaker is propelled forward, it moves up onto the ice, and the weight of the hull breaks the ice. The traditional icebreaker bow is in the form of a spoon that fa-cilitates this action. The ability of an icebreaker to break ice is, therefore, a function of the ship's weight (displacement) and propulsive power for forcing it onto the ice.

In seeking a general definition of a polar icebreaker, one authority has developed a listing that includes the following parameters:

- Having sailed in significant sea ice in either the Arctic or the Antarctic,
- Ice strengthening sufficient for polar ice, and most significantly,
- Installed power of at least 10,000 horsepower

The Chinese icebreaker Xuelong is a B1 icebreaker capable of breaking 1.1 meters of level ice continuously at 1.5 knots, with 18,000 shaft horsepower and a displacement of 21,025 tons. It is outfitted with all of the wiches and A-frames necessary for deploying and retrieving oceanographic instruments. It has a net worked computer suite, including multi-beam sonar, and a helicopter pad and hanger. It has the dual purpose of supporting oceanographic science work both in Southern Ocean and Arctic Ocean as well as providing resupply to stations in Antarctic.

3.2 Icebreaker crewing

Because crew composition and size flow naturally from the mission and characteristics of a particular ship design, it is difficult to develop crewing alternatives without detailed information about a new icebreaker. Nowadays, the engineering control and monitoring system of icebreakers reflects a generational leap in sensor and information technology. The maintenance philosophy was largely shifted from labor-intensive preventive procedures to condition-based monitoring, trend analysis, and real-time technical troubleshooting from ashore. Smoke, fire, and flooding sensors are numerous, centrally monitored, and backed by CO2 flooding and water sprinklers. An integrated bridge system permits safe navigation by two watchstanders, and major deck and aviation evolutions can be conducted with far fewer people. Improvements in storeroom and food-service spaces also save man-hours. However, the icebreaker still need to be operate independently in either or both polar regions; be capable of conducting the resupply alone in all but the most adverse conditions; and be capable of operating in the high Arctic in summer and in lesser Arctic ice conditions in other seasons. Therefore, the Sailing crew of icebreaker shall be able to operate up to four months continuously and provide support to science parties, passengers;While under way, the crew

would be capable of operating the ship and its installed winches, cranes, and boats, and supporting helicopters if carried onboard ;Officers shall be able to operateengineering monitoring and control systems, integrated bridge system, centrally monitored smoke, fire, and flooding alarms, et cetera; full crew availability for maintenance, supervision of contract work, gear on-load and off-load, and other cruise preparations.

3.3 Weather service

Navigating in the polar region, weather service as a supporting measure is quite important. It can not only provide mariners important weather forecast for few days but also predict the ice condition that the ship will go through according to the nephogram. Consulting the information given by weather service, the ship master could take precautions as soon as possible such as swing around the ice pack by altering the course and apply for icebreaker assistance.

3.4 Knowledges for ice and floes

1)Sea Ice Concentration

Sea ice concentrations are monitored closely by scientists because changing sea ice concentrations can have a huge impact on the rest of the globe. Global warming is amplified in polar regions. Because of this, monitoring changes in sea ice can be a good indicator of climate change. Consulting the ice concentration charts can help navigators of icebreakers to determine potentially passable regions.

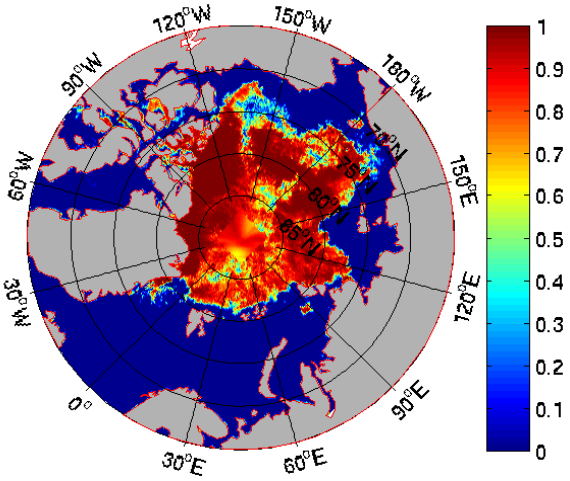

Figure 5. August 12th 2010 Sea Ice Concentration Diagram

2)Categories of ice and formation process

There are many ways to classify the sea ice. According to the formation process of ice, it can be divided into frazil ice,young ice , first ice and multiyear ice.

Sea ice is largely formed from seawater that freezes. Because the oceans consist of salt water, this occurs below the freezing point of pure water, at about -1.8 °C. The most important areas of pack ice are the polar ice packs formed from seawater in the Earth's polar regions: the Arctic ice pack of the Arctic Ocean and the Antarctic ice pack of the Southern Ocean. .

General speaking, it is easier for vessels to go through the young ice and frazil ice than first year ice and multi-year ice. The first year ice and multi-year ice are usually hard with ice ridges and ice hummocks, which threaten the safe transit of ships. Only under the help of the icebreaker can ship possibly go through that area.

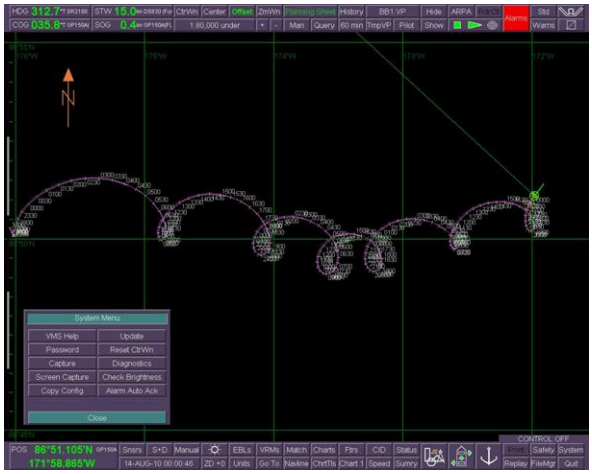

Figure 6. Drifting track for an ice floe at latitude 56°50'N

3.5 Miscellaneous

As the limited information about the navigable area of polar region, the icebreaker shall try to get more support from the land-base. Therefore, more accurate and important information can be obtained in time for further decision.

If the weather is possible, the helicopter shall also be used for ice detection. Professional pilot with experience of polar navigation shall be employed and the related supporting communication shall be carried out by experts onboard.

4. Manoeuvring methods in polar region

4.1 Manoeuvring in heavy weather

In the days of sail the wind and waves were all important. Favorable wind and currents still remain basic elements of passage planning, and the successful execution, of the ships

endeavours. To avoid heavy weather is the one of the topics of serious concern to the ships' crew. Heavy rolling or pitching is dangerous and uncomfortable as well may cause damage to ship or cargo.

For the polar region, seamen all know the roaring forties with prevailing westerly wind, to the latitudes between 40°S and 50°S. It the only way which must be passed by the icebreakers in order to reach Antarctica.

Before going through the roaring forties, the following seamanship shall be taken by sailors:

1) Updating the weather reports
2) Verifying the vessels position
3) Considering the suitable routes
4) Reducing ship speed if necessary
5) Tightening all cargo lashings, especially deck cargo securings.
6) Closing up ventilation as necessary
7) Checking securing on accommodation ladder, survival craft, anchors, derricks, cranes, hatches, oceanographic equipments and the helicopter.
8) Closing up all weather deck doors
9) Reducing manpower on deck

When navigating in the rough sea, the mariners shall adopt different manoeuvring methods according to different conditions in order to avoid synchronism, propeller racing, ship water on deck and pooping etc.

When vessel is required to turn, the main concern for a vessel with the wind and sea abaft the beam arises. A distinct danger of attempting to turn across the wave front is the vessel may "broach to". The rough sea reduces the flow of water past the rudder, so that steering may become difficult, and prevent the vessel's head coming up to wind. With reduced rudder effect, the vessel may be caught in an undesirable beam sea and may 'broach to', being unable to come into the wind and sea. At this time, 'heaving to' shall be adopted by mariners after due consideration of all circumstances.

4.2 Manoeuvring in floating ice region

Mariners entering ice regions should take early action to seek up-to-date ice report from the related institute. Ice boundaries should be marked on to navigational charts. The course and speed of the vessel could be adjusted accordingly and if it is possible other measures such as helicopter ice detection shall also be carried out in time so as to find the most efficient and safest route. Careful lookout shall be performed during daylight hours as well as at night, even in good visibility. If the visibility is poor, the ship shall be prepare to stop during the hours of darkness.

Navigating in the polar region with floating ice, the ship shall try to sail along the limits of ice. If the ship has to cross the floating ice, the right time, position and methods as follow shall be taken into consideration:

- Choosing the ice floe with wide ice cracks. The wider the ice crack is, the easier for the vessel to squeeze through.
- Choosing the ice floe with more ice cracks(see figure 7). More ice cracks means that the floating ice has more room to move when ship is crashing on the ice. Accordingly, the ship could push them away to create a navigable channel.
- Choosing the ice floe with less extent. The ice floe with less extent usually has a soft edge and it is easier for vessel to go through.
- Choosing the thin ice floe. It it not easy to find the difference of thinness of the ice floe in a small extent. However, when navigating in the ice floe of huge extent, it is possible to find it out. The thin ice floe is easier for ship to go through and prevent possible damages to the ship.
- The vessel must endeavour to keep moving into ice and making headway.
- If the vessel become trapped in the ice and held, a movement astern should be considered as an option. However, continuous movement astern should be avoided because of the very real danger to rudder and propeller and the speed shall be controlled.
- The possible navigational aids shall be used for detecting. Generally, set the range of radar on 3 nautical miles and the radar image may help mariners to find waterway between floating ice. It is important that this is only a supplementary device and the proper look shall never be neglected.
- The mariner will require a great deal of patience and prudence.

Figure 7. ship manoeuvring in floating ice region

4.3 Manoeuvring in icebergs

For ship navigating in the Southern Ocean, it is most dangerous to encounter with icebergs. When the visibility is good, the most effective way to avoid icebergs is to alter course and keep a safe distance from icebergs. When the visibility is poor, the reduction of speed shall be necessary. However, the speed shall still be kept in a reasonable range that may not influence the steerability of ship. If the steerability is poor, on the contrary, it may influence the iceberg avoidance operation.

When the ship passes the iceberg in the darkness or poor visibility, it shall keep a safe distance at least 1 nautical mile. It could get a little bit closer in daylight or in good visibility. Encountering with bad weather, the ship shall pass the iceberg from the upwind side with a distance of more than 1 nautical mile. When the weather is good or the ship is on the leeside of the iceberg, the ship could pass the iceberg a little closer. As to those icebergs with great height and loosing structure, the ship shall pass them as far as possible.

5. Conclusion

The melting of Arctic ice as a result of climate change has made it possible to send ships along the legendary Northeast Passage. It means that more and more mariners may have the opportunity to navigate in the polar region. Therefore, he knowledge of polar area and the related manoeuvring methods are necessary for them to handle. The authors worked on icebreaker Xuelong as officers and sailed from the Antarctic to the Arctic for more than 200 days in polar region. In this article, the authors focus on the manoeuvring methods in polar region and hope could give useful ideas to those concerned. However, more and more advanced technologies are being used for the icebreakers and ship manoeuvring, further works are still needed in the future.

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Lifelong Learning Arrangements in Chinese Shipping Enterprises in the Context of an Emerging Knowledge Economy

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Abstract

There is a proverb in China: huo dao lao, xue dao lao, which means keep on learning as long as you live. This is an ancient thought for Lifelong Learning. How does this apply to nowadays? Kessels (2001) stated that knowledge productivity will remain the dominant economic factor in a knowledge society. The demand for knowledge productivity and the importance of continuous learning are described as the two sides of the same coin. As a result, continuous learning is of vital importance in a knowledge society. In the context of an emerging knowledge economy, Chinese shipping enterprises face many challenges. The increasing globalization and technological revolution have been identified as two primary factors. Given the rapid changes that all enterprises face, it is clear that employees must continue the learning process throughout their careers in order to meet these challenges. Chinese shipping enterprises must find a way to provide Lifelong Learning opportunities to all of their employees. This paper is intended to explore a new conceptual framework of learning arrangements that contribute to the Lifelong Learning of employees in Chinese shipping enterprises in the context of an emerging knowledge economy.

1. Introduction

The Lifelong Learning movement is now rampaging around the whole world (Longworth, 2003). Cropley (1977) stated that the reasons that have led to this increased interesting in the promotion of Lifelong Learning arise from the phenomenon of change that is a major element in contemporary life. McClusky (1974) connected change and Lifelong Learning in a succinct way, pointing out that continuous change requires continuous learning. Lifelong Learning is particularly appropriate for this age and necessary at a national, organizational, and individual level in the international competition. This paper would construct a new conceptual framework of Lifelong Learning arrangements for Chinese shipping enterprises from the educational system level, the organizational level, and the individual level.

2. Literature study on Lifelong Learning

Commission of the European Communities (2000) in the Memorandum on Lifelong Learning defined Lifelong Learning as: all learning activity undertaken throughout life, with the aim of improving knowledge, skills and competencies within a personal, civic, social and/or employment-related perspective. The definitions about Lifelong Learning are not static. In spite of the variation, the concept of Lifelong Learning emphasizes that the process of learning should occur from cradle to grave and cover an individual's lifespan. Lifelong Learning could be started at any time and is not limited to formal learning, which also includes non-formal learning and informal learning. The further clarification of Lifelong Learning's characteristics as follows:

- Covering all life. Lifelong Learning is about learning throughout the lifespan from cradle to grave and starts at any time.
- The widest boundaries. Lifelong Learning has the widest possible boundaries, which includes formal learning, non-formal learning and informal learning.
- Participative learning. Lifelong Learning is a social activity and people actively participate in learning teams, groups and communities, learning from each other.
- Fun and Life-based. Lifelong Learning is seen as fun, not boring but a pleasurable activity to gain wisdom and improve the quality of life. Lifelong Learning is life-based, focusing on applying knowledge and skills in all environments. In Lifelong Learning, the most important thing is what people could achieve in real-life situations.
- The having ownership learner. Lifelong Learning focuses on the needs of the learner. The learners themselves have the ownership of learning.
- The sources-guide teacher. In Lifelong Learning, teachers and trainers are guides to sources of knowledge, serving as facilitators rather than transmitters of knowledge.
- Failure-free examinations. In Lifelong Learning, examinations are seen as failure-free personal learning opportunities encouraging further learning.
- The whole lifespan learning opportunities. People have access to learning opportunities that are available over the whole lifespan and accessible on a widespread basis.

What is the historical background of Lifelong Learning? Kallen (2002) explored two origins that determined the conceptualization and development of Lifelong Learning: the nineteenth-century industrial revolution with its aftermath of social and cultural upheaval and the evolution of civil society towards democratic participation and self-management, spurred by a tidal wave of political unrest and protest against domination, whether from above or abroad. Hasan (1999) presented that most of those who write about Lifelong Learning trace the origins of the concept back to the 1920s when the term 'lifelong education' first appeared in English translation linked to discussion of Nordic education systems. Despite the long history, the concept was discussed widely only after the Second World War and assumed

significance for education policy in the 1960s (Hasan, 1999). Since the 1970s, the concept of Lifelong Learning has developed as follows:

- Hodgson (2000) state that the term 'Lifelong Learning' appears to take its place in the 1970s alongside other terms such as 'recurrent education', 'popular education', 'continuing education', 'adult education' or simply 'post-initial education and training' in international policy documents of the time. The most often cited international policy document of this era, where the term Lifelong Learning is used, is the influential Faure Report, Learning To Be (Faure et al, 1972).
- Sutton (1996) said that during the 1980s, the incidence of bibliographic references to the terms lifelong education and Lifelong Learning declined, while those to the term 'adult education' continued to remain at a constant level. It may be that the focus in many countries throughout the 1980s on combating the severe social and economic effects of recession and widespread unemployment by raising the literacy, qualifications and skills base of the adult population explains why a more specific term, such as 'adult education', proved more useful for policy makers (Hodgson, 2000).
- Hodgson (2000) stated that during the 1990s, at international policy level, and in many individual countries at national level, Lifelong Learning became an umbrella term which subsumed part or all of what might earlier have been referred to as 'lifelong education', 'recurrent education', 'popular education', 'adult education' or simply 'post-initial education and training'.

The history of Lifelong Learning has been promoted by three international organizations: the United Nations Educational, Scientific and Cultural Organization (UNESCO), the Organization for Economic Cooperation and Development (OECD), and the Commission of the European Communities (CEC). These three international organizations have been most responsible for its development:

- Fagerlind (1999) stated that UNESCO's Faure Report 'Learning To Be', published in 1972, was considered by many to be one of the most important educational reform documents of the second half of the 20th century. In 1993 UNESCO formally established an International Commission on Education for the 21st Century. The final report of the Commission has the title Learning: The Treasure Within (Delors et al., 1996). Although this report was published in 1996, it still contains a considerable treasure within (Longworth, 2003).
- Longworth (2003) stated that OECD has long been a strong supporter of Lifelong Learning. OECD's own landmark report 'Recurrent Education: A Strategy for Lifelong Learning', produced in 1973, was well received by governments, higher education and NGOs alike; 'Lifelong Learning for All', OECD's flagship justification for Lifelong Learning, resulted from the 1996 conference of Ministers (Longworth, 2003). OECD (1996) adopted a definition of Lifelong Learning: Lifelong Learning is best understood as a process of individual learning and development across the life-span, from cradle to grave – from learning in early childhood to learning in retirement.

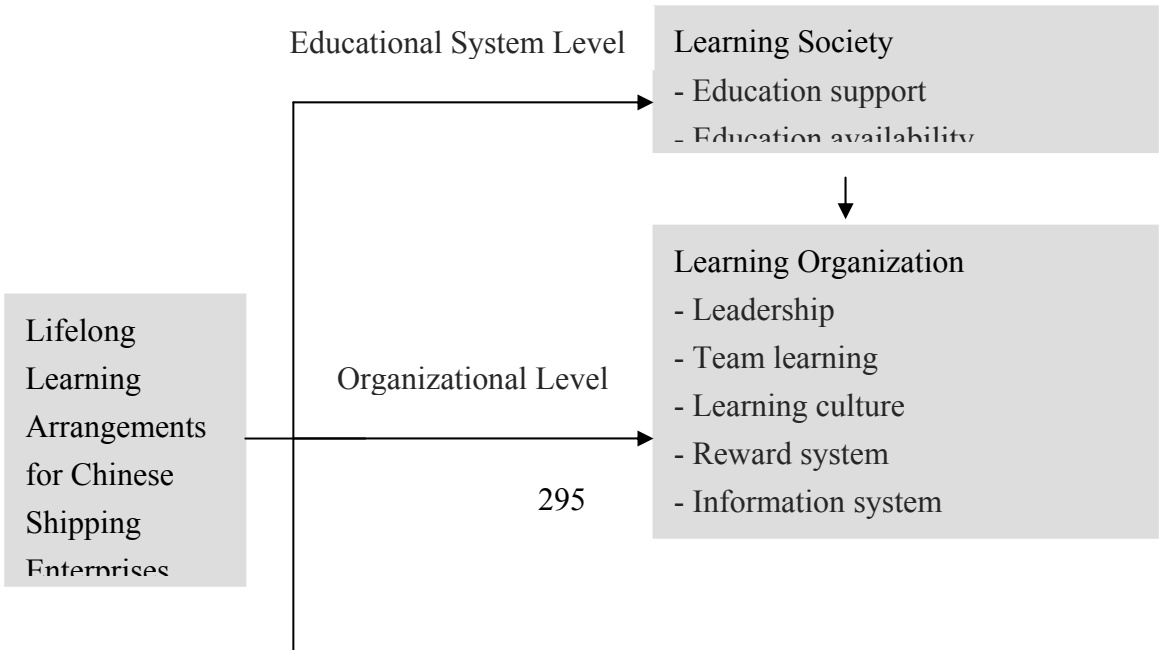
- Another support for Lifelong Learning is from CEC. Waddington (2002) introduced that in the early 1990s, it was a time of high unemployment and low economic activity and Europe was facing the significant challenges. Jacques Delors proposed some solution in his 1994 white paper Growth, Competitiveness and Employment. This paper paved the way for a development of European policies and programmes for Lifelong Learning. Another highly influential document from CEC is the Memorandum on Lifelong Learning (CEC, 2000).

3. The current organizational learning situation in Chinese shipping enterprises

The current situation in the aspect of organizational learning in Chinese shipping enterprises is as follows: (1) Comparing with the learning ability of entrepreneurs, the organizational learning ability is feeblish, especially in the aspect of gaining knowledge and transferring knowledge. (2) Enterprises attach importance to training, but did not combine the training achievement with promotion and monetary reward, and did not adopt modern electronic learning system. The whole training management is not scientific. (3) The rate of employees participating enterprises' training, the investment of enterprises to training and the quality of training are low. Employees with higher educational degree and higher position have more training opportunities than those with lower ones. (4) Difficulties restricting labors to participate in learning and education, such as lacking of time guarantee, lacking of financial support, and lacking of opportunities for training.

4. The conceptual framework of Lifelong Learning arrangements

Conceptually, Lifelong Learning is related to two other concepts, learning organizations and learning society (Merrill, 1977). Tight (1998) suggests that the concept of Lifelong Learning has become part of a trinity: Lifelong Learning, the learning organization, and the learning society. The conceptual framework of Lifelong Learning Arrangements for Chinese Shipping Enterprises would be constructed as Figure 1. This framework would be illustrated in detail from subsection 4.1 to 4.3.



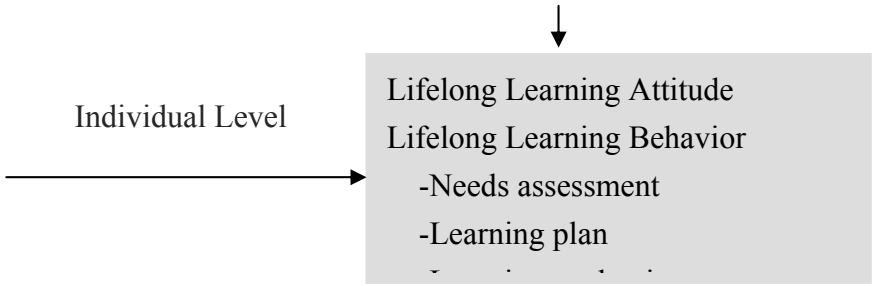


Figure 1. Lifelong Learning Arrangements for Chinese Shipping Enterprises

4.1 The educational system level

A learning society motivates and provides both formal and informal learning to cultivate a culture of learning from the cradle to the grave. It provides a good social environment for Lifelong Learning. What kind of aspects could promote the learning society and Lifelong Learning in it? School education plays a basic role of establishing learning society (Hao, 2006). Jarvis (2004) also argued that Lifelong Learning has become a social phenomenon- it is about learning but it is also about education. At the educational system level, Chinese education support and educational availability would be stated.

4.2 Education support

The Chinese government is the main provider of education and it has made a great advance in expanding access to education (Dahlman, Zeng & Wang, 2007). In spite of those achievements, China still faces some challenges in education and training. China has the world's largest education and training market, growing at unprecedented speed. The overall educational attainment of the population is still low. There are widening disparities among provinces and within provinces and the coastal regions are richer in educational levels and resources, from both the public and private sectors.

4.3 Education availability

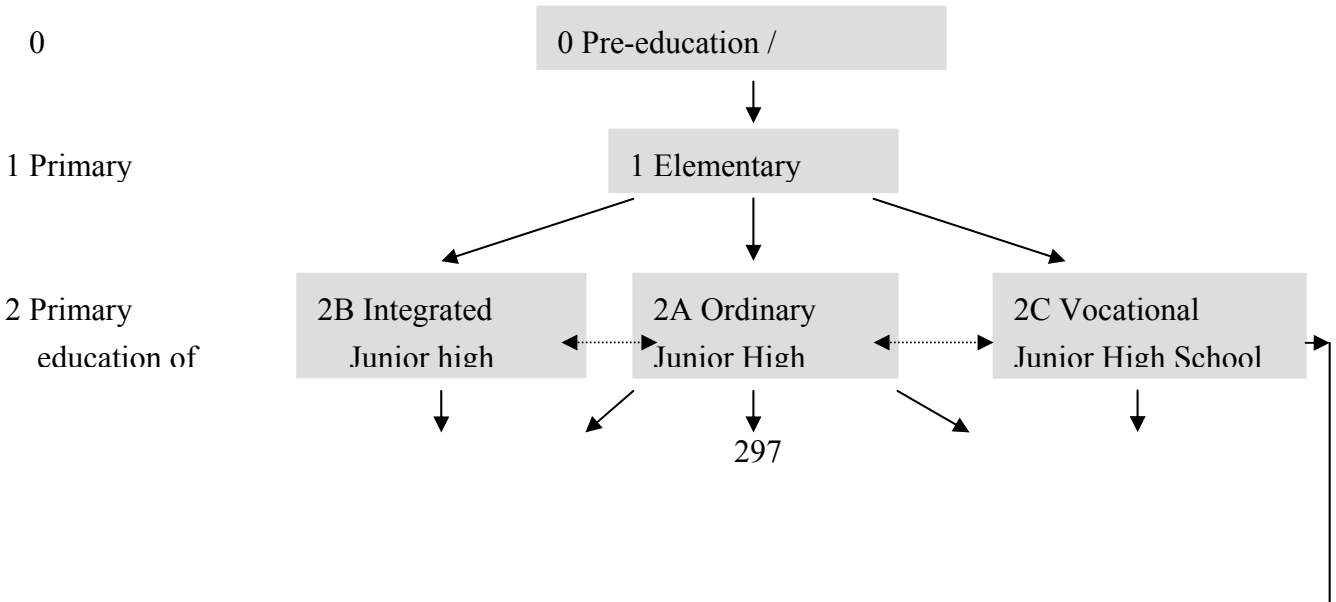
According to the challenges and situation that China is facing in education and training, Dahlman (2006) mentioned that China need to continue enlarging the scale of formal education system and improve the quality of education. Hao (2006) also advocated of enlarging opportunities of learners' choices of being educated. She suggested: establishing open and flexible educational system, which could satisfy diversified needs of learners; making learners be content with their constant improvement of needs and choices of being educated, especially between the senior high school (Level 3) and higher education (Level 5)

adding a Level 4 aiming to offer more choices for learners with continuing education and working after finishing their senior high school. Consequently she put forward the assumption of educational classification and relationship between different styles of schools (Figure 2) to improve the current situation of lacking communication and connection among schools especially the connection between vocational schools and ordinary schools. Her assumption could be regarded as a good way to enlarging opportunities of receiving education.

At the educational system level, an important issue is about a certain curriculum that finds priority time for young learners to develop Lifelong Learning skills and enthusiasm. Longworth (2003) mentioned that learning attitudes and skills built up during the early learning process would have a profound effect on total human development. A certain curriculum for cultivating Lifelong Learning skills and enthusiasm during initial education seems to be necessary to develop in the future. To guarantee Lifelong Learning further, an important recommendation is to enact Chinese Lifelong Learning Promotion Law, which is the prerequisite to implement Lifelong Learning policies, and establish Lifelong Learning Councils from the central government to the local government, which are organizations to developing Lifelong Learning policies and put them into practice.

4.4 The organizational level

It has been widely acknowledged that many learning opportunities have to be provided by the non-educational sectors of society, such as the corporations (Jarvis, 2004). Advocates of Lifelong Learning recognize that the development of learning organizations is a trend enabling Lifelong Learning (Longworth & Davies, 1996). Learning organizations can provide a good learning environment to cultivate Lifelong Learning of employees at the organizational level. Senge (1990) defined the learning organization as: Learning organizations are organizations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together. Six main elements to establish the learning organisation are identified as follows:



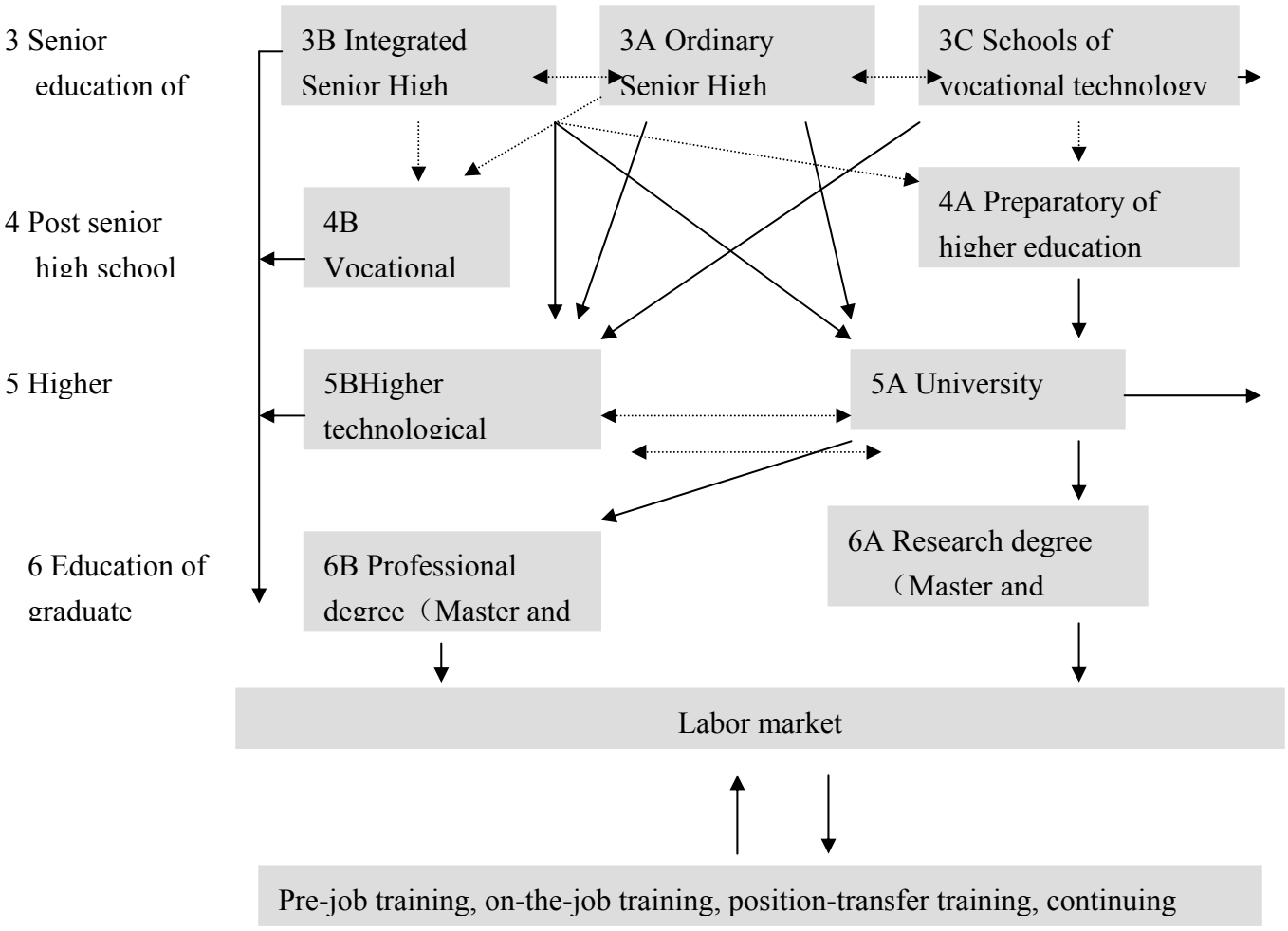


Figure 2. The assumption of educational classification and relationship in China in the 21 Century (Hao, 2006, translated by the author) Note: representing school - transfer

Leadership**.** Leadership is an important and solid foundation for the implementation of organizational learning. Welch regards that leader is the real engine which provides the convenience for organizational learning (Luo, 2007). Sessa and London (2006) presented that a powerful promoter of an organization's learning is top management. Lifelong Learning leaders will be good learning examples and inspire their staff. Lifelong Learning leaders can share their learning experiences with their employees, because they have their own Lifelong Learning experience, they are easier to find, understand and will establish effective ways for their members' learning.

Team Learning. Senge (1990) presented that team learning is a process of developing the ability to create desired results; to have a goal in mind and work together to attain it. Senge found that teams are the fundamental learning unit in modern organizations.

Communication. In China, the original meaning of communication is two ditches of water connecting with each other through opening up the ditches and eliminating the barriers (Zhang, 2008). Confucian culture emphasizes harmony in the aspect of interpersonal

communication. Confucius put forward the proposition of "Ren" which means beneficence, "Loving human being" and "Harmony is precious", which formed the theoretical foundation of human relationship in Chinese ancient times and also the basis of modern communication theories (Zhao, 2005). Keyton (2005) presented that two important issues need to be addressed with organizational communication: First, it is important to note that all organizational members participate in this process and communication is not the sole responsibility or privilege of managers; Second, while the process is said to be transactional in which all parties enact both sender and receiver roles to create mutual and shared meanings of messages, shared meaning is not always achieved in organizational settings.

Learning Culture**.** In the learning organization, learning is the central theme of activities and organizations create an environment that promotes and supports learning. Sessa and London (2006) introduced Self-Learning Culture that is a kind of culture promoting self-learning. They regarded that learning is self-determined and outsiders cannot direct a living system to learn, they can only support it that includes providing learning triggers, opportunities, and resources for learning. One important element in the learning environment to encourage employees' learning activities is to be tolerant. AriendeGeus put forward the managerial style of tolerance, which contradicts with the managerial style of controlling and strictness in Chinese organizations, but it can bring some enlightenment to Chinese enterprises (Chen & Liu, 2007).

Reward System. Employees are not likely to adopt new behaviors if the reward system continues to measure and reward them on the basis of the old behaviors (Tobin, 1998). For individuals' learning activities, whatever salary reward or through relevant content close to their individual needs are particularly useful approaches to keep them learning. The research from Argyris (1994) shows that employees, only with secondary sense of responsibility and morale, could achieve obvious working efficiency, and the key point is that monetary reward and working secure system could make employees feel equitable. Employees need a clear and flexible reward system to encourage their further learning behavior and better job performance. Pedler, Burgoyne and Boydell (1991) promoted that reward flexibility means there are alternatives in both monetary and non-monetary rewards to cater for individual needs and performance. Appreciation and positive recognition from surroundings will motivate employees to perform better and better.

Information System. The information system is a key element of organizational development through supporting its learning activities, especially when employees have free access to the Internet, and their learning activities are supported by the computer information system. The information system improves employees' performance and efficiency that will lead to their organization's development.

4.5 The individual level

Sessa and London (2006) introduced that organizational learning is a collectivity of individual learning and a learning organization would focus on valuing, managing, and enhancing the individual learning of its employees. At the individual level, the Lifelong Learning attitude and behavior would be put forward to make an effective personal Lifelong Learning.

4.5.1 Lifelong Learning attitude

The relationship between attitude and behavior is one of the topics that are investigated most in the field of Social Psychology (Zeng, 2007). Social Psychologists attempt to explain how and why attitude impacts behavior (Taylor, 2001). Ajzen and Fishbein created the Theory of Reasoned Action in 1967. In basic terms, the Theory of Reasoned Action includes that a person's behavior is determined by the attitude towards the outcome of that behavior and by the opinions of the person's social environment (Taylor, 2001). When learning behavior needs to be encouraged, first of all a positive learning attitude should be developed. A positive attitude is a prerequisite for active learning behavior.

4.5.2 Lifelong Learning behaviour

It is a complete process from needs assessment, to learning plan and learning evaluation.
Needs assessment is a process by which an individual's learning needs are identified and articulated. The learners not only reflect on their past learning experiences in all aspects of their life but also reflect on their present attitude and participation in learning activities, and then list all the things that are interesting and necessary to learn if the money, time and motivation are available. It is the starting point of the learning process.
Learning plan is a process by which learners design their learning activities through personal plan. The learners set personal learning objectives in a realistic way and devise learning strategies for achieving them, and then turn the formulation of learning objectives and strategies into a written, realistic and formal plan to be carried out. The learners also add to or change their learning plans frequently in the light of new information. With the learning plan, personal learning activities will be more systematic, sustainable and directional, and the learning plan is helpful in evaluating individual learning constantly.
Learning evaluation is where the effectiveness of the learning process and achievement is measured. It usually includes: (a) Self-assessing the extent to which their learning goals have been achieved. (b) Self-assessing and reflection on their entire learning process. (c) Evaluations by others like colleagues or mentors. On the basis of the assessment, they design

better strategies to promote the achievement of learning goals and identify pathways for future learning. Learning Evaluation is the final phase in the learning process.

5. Conclusion

In a knowledge economy, with a view to economic competitiveness, organizations must become at the same time learning organizations and develop Lifelong Learning. Lifelong Learning is particularly appropriate in a knowledge economy era. This project is intended to explore the kind of learning arrangements that contribute to the Lifelong Learning of employees in Chinese shipping enterprises in the context of an emerging knowledge economy. Dahlman, Zeng and Wang (2007) presented that the Lifelong Learning research and actions should be open enough to constantly absorb, adapt, and apply new and successful experiences globally and locally. The research in this paper also needs to be integrated with the evolving global system to keep itself updated

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Competence Based MET and the Role of Group-Learning Methods

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Abstract

Global standards of maritime education and training mandated by the International Convention on Standards of Training Certification and Watch-keeping for Seafarers (STCW) and specified in terms of desirable abilities of prospective seafarers as well as of those serving at different levels of shipboard hierarchy, while provide an excellent framework for development of competency based curriculum they clearly fall short of identifying the contents of educational inputs as well as specifying the levels of knowledge and skills for achievement of minimum standards of competence. The setting up of actual standards of requisite knowledge and skills is left to the individual parties and their Maritime Education and Training (MET) institutions. This lacuna in concert with the wide variance in the types of ships, their equipment, applied technology and modes of ship operations have led to a huge diversity in the standards of competence required of the seafarers. Recent trend of raising the standards of MET to satisfy requirements for academic awards in line with national educational systems in some places vis-à-vis maintaining the minimum standards prescribed by STCW Convention in the others, further add to the diversity of competence standards. Aside from such undesirable variance in the MET standards the methodology adopted for transfer of knowledge plays an important role in developing competence which unfortunately finds no mention in the internationally prescribed standards.

The paper examines the suitability of available alternatives that espouse the philosophy that the measure of competence should be based on performance rather than on the possession of knowledge and skills; on understanding rather than enhanced repertoire of knowledge; on the process of transfer of knowledge and skills moving from teacher-centred learning to student-centred learning to promote understanding with particular reference to the application of group-learning processes, that take a holistic view of all pertinent factors affecting performance.

Key words: STCW, competence, group-learning, performance

1. Introduction

It is a commonplace in the shipping industry safety parlance that all the major international safety conventions and their amendments were created in response to accidents of highly adverse consequences. Adoption and implementation of the STCW Convention too was in response to the outcomes of enquiries into ship accidents that pointed to 'human error' as the main causation factor. It is usual to come across statements that 80% of accidents are caused by human error (Rothblum et al 2002; Baker et al 2005). Lessons learnt from the incidents and accidents do provide us with the essential knowledge for avoiding their recurrence provided of course the causes identified are actual or close to reality.

Investigations and analysis of most inquiries into mishaps that occurred in the nuclear, aviation and process industries have emphatically identified human factors as the main reason for accident causation. Such literature points to a numbers of factors at the human-machine interface leading to situations which predispose operators to commit errors. There is a greater realisation of the influence that the organizational, environmental and job factors have on safety of a socio-technical system. Deliberations on the impact of organizational and work environment factors on shipboard accidents are out of scope of this paper and are not discussed. Similarly discussions on physiological and psychological factors like fatigue and attitudes among the personal factors of seafarers are not included.

Literature is abound with statements emphasising the role of human element at different levels of management hierarchy in a socio-technical systems as substantially contributing to accidents by producing preconditions for unsafe situations at the human-machine interface. This accentuation is however based on presuppositions that the front line operators at the human-machine interface possess the requisite knowledge, understanding and skills to operate the technical systems, make appropriate decisions and take suitable actions to ameliorate unsafe situations that may develop. Competence of operators is without doubt one of the most important human factors in operational safety. Developing prospective seafarers who possess requisite competence demands an efficient transfer of specified knowledge and skills during their academic learning period and later during their professional careers. Objectives of MET are intended to engender deep learning of relevant concepts and development of psychomotor skills through implementation of physical and cognitive apprenticeship. Specifying and implementing suitable methods for assessment of competence are no less important as they have a strong bearing on the process of learning and its measurement. This paper explores collaborative learning techniques for delivery of curriculum from the stand point of their relevance, feasibility and long term impacts on the professional life of the prospective seafarers.

2. Background

The response of the world community, through the auspices of International Maritime Organization (IMO), towards maritime catastrophes has immensely contributed to raising the standards of ship designs, constructions and equipment on board. The down ward trend in the rate of occurrence of major accidents, loss of life, property damages is a testimony to the effectiveness of such globally agreed regulatory efforts. At the same time however on an average over a hundred ships (over 100 gt) and hundreds of valuable lives are still lost annually (Lloyds 2009). Shipboard safety demands more than sophisticated equipment and automation. The human element has always been the foundation on which everything else is built upon and will remain so irrespective of all the technological advances.

Operational error on part of the seafarers has been identified as a prominent accident causation factor in number of maritime accidents. Erroneous or unsafe acts committed by the operators leading to failures (active failures at the man-machine interface) in a socio-technical system have been generally referred to as 'human errors' which have been summarised as the failure of planned actions to achieve their desired ends (Cacciabue 2004). The unintentional outcome of planned actions may be due to a lapse or a slip characterised by memory failure and attention failure respectively. In contrast the mistakes are operational failures that occur as an outcome of wrong selection of a plan of actions or a procedure. These errors in planning are committed due to the lack of operator competence (Reason 1997).

Analysis of investigation reports of accidents in machinery spaces, available of the websites of six national authorities, namely the Australian Transportation Safety Bureau (ATSB); Transportation Safety Board Canada (TSB); Danish Maritime Authority (DMA); Marine Accident Investigation Branch UK (MAIB) and the National Transportation Safety Board USA (NTSB), indicates that lack of generic marine engineering knowledge, applicable seamanship knowledge and specific knowledge and training concerning the involved ship's machinery and engineered systems have been responsible for 19.4% of accidents in machinery spaces. A similar study carried by Makoto Uchida analysing the court judgement reports on accident enquiries concerning machinery spaces has concluded that 20.7% of accidents are attributable to knowledge based errors (Uchida 2004).

Aetiological literature puts the accident causation factors into three categories the organizational factors, the work environment factors (job factors) and personal factors. Personal factors primarily relate to the front line operators (Shaw 2002). They encompass the technical and social competence, physical & mental abilities and capabilities, aptitude and attitude of the operators. STCW Convention emphasises on competence as the intended outcome of MET. It specifies criteria for assessment of competence as well as a number of assessment method alternatives for each competence. For various reasons however the process of curriculum delivery at MET institutions continues to be such that engenders the behaviourist as against constructivist approach to learning, surface learning as against deep

learning and producing short time learners as against lifelong learners. Specified methods of assessment in the convention also encourage such types of learning characteristics.

3. Standards of MET for Competence Development

3.1 Standards of Technical Competence

The standards of MET have always been based on the industry requirements commensurate with contemporary technology with due cognizance to the national and international safety regulations. Rapidly changing technology for reasons of enhanced safety, reduced operational cost, higher productivity and better working conditions for operators has always created a gap between the standards of competence demanded by the technology and those set by the MET institutions. Consequently there is always a time gap in updating of curriculum to the changing operational needs. This inevitable gap is detrimental to the safety and efficiency of operations.

The competencies listed in the mandatory Code A of the STCW Convention and the standards of knowledge, understanding and proficiency while provide general guidelines for development of curriculum they very much fall short of specificity of standards. Thus the interpretations by default are left to individual institution/education authority/maritime administration in line with the national educational standards control system. Learning objectives within this frame work of competence tables are set on the basis of operational demands from the industry i.e. the types of ships, their equipment and technical systems which inevitably are generic in nature. It is impossible to cover all perceivable types and makes of machinery and equipment in the curriculum. This obviously is a recipe for undesirable variance in the standards of targeted competence of seafarers.

3.2 Standards of Social Competence

Employment pattern of seafarers have been changing overtime. Targeting cheaper workforce from the labour supplying countries leading to what is normally referred to the 'globalisation of crew' has an impact on the level of available competence as against that demanded. The process of globalisation of crew has introduced a broad social and ethnic diversity as a result of multinational crew with varying and inadequate professional standards (IMO 2002). This pattern of ship manning has accentuated the need of social skills on part of the seafarers. Resoling differences in opinions through discussions and agreements, honouring others' view points, caring for others and taking them along are crucial aspects of

living in a community and especially small and isolated community on seafarers on board each ship. Developing amicable human relations, team work and leadership skills are legitimate and valuable classroom goals not just extra curricular ones (Smith & MacGregor 1992). This is as applicable to MET as to any other educational set up. Shipping companies while engaging seafarers aside from technical knowledge and skills also look for communication skills and psychological attitude towards team work (Saxena 2009).

One of the competence requirements for engineering staff at management level included in Table A-III/2 of the STCW Code, specifies knowledge of personal management, organization and training on board. Personal management is a vast subject and in the absence of specificity of learning objectives and lack of guidance the actual course contents are solely dependent on the course developer's perception of needs, his/her experience & background, personal preferences and national regulations on crew employment leading to a diversity of standards of social skills repertoire of trainees.

3.3 Standards of Curriculum Delivery

STCW Convention requires training and assessment through well structured written programmes for achieving prescribed standards of competence. This implies documented learning objectives, procedures for delivery of course material and assessments. While minimum education and training standards in the form of expected competences provide some, though limited, guidance on the standards of curriculum contents, there is no mention of the process of transfer of knowledge, enhancement of understanding or development of skills. There is of course a specific requirement in the provisions of the STCW Code that the instructors, supervisors and the assessors are appropriately qualified and it does imply that they possess the necessary skills to implement appropriate procedures to affect students' learning.

4. Techniques for Effective Learning

4.1 Transfer of learning

The philosophy of education and training for engineers, and for that matter for seafarers, is based on the general belief that once the prospective seafarers acquire the minimum requisite knowledge and practical skills in their learning environments of class rooms, laboratories, workshops and on board, they will be able to modify them as necessary and

apply them to meet the operational demands in their actual work situations. Transfer of learning is a fundamental assumption of educators and they believe that whatever knowledge and skills are transferred will be retained or remembered over some interval of time and used in appropriate situations (Leberman et al 2006). The transfer of the learnt knowledge and skills to meet the requirements of the work situations are greatly influenced by the level of knowledge and skills repertoire, context under which they were acquired and upon the cognitive dexterity of the individuals. The suppleness of knowledge and skills transfer to work situation depends upon the ease with which learning can be retrieved which in turn is a function of how the material was learnt. Stronger the understanding and comprehension of learnt knowledge more readily the transfer can occur. Learning that occurs during onboard training, practical exercises or on job is more easily transferred than those learnt in the class room (Cunningham et al 2004). Conceptual learning that involves understanding is more likely to be transferred than the material that is merely committed to rote memorization because thinking at deeper level of abstraction facilitates transfer by fostering meta-cognition (Phillips et al 2009).

4.2 Factors affecting the learning process

Outcome of learning may be gains in knowledge, acquisition of skills, deepening of understanding and capacity to reflect; development of problem solving skills; change in perception, attitude, values and behaviour; and desire to learn more (Brown 1999; Cunningham et al 2004; Clifford 2007). Humans have natural propensity for learning, they are curious, they are natural decision makers and problem solvers and because they have needs and goals they are motivated to learning. For any learning to take place however it is essential that the person, as a learner, is actively involved in the process of learning. In case of an adult this involvement means creating meaning out of the new information in relation with the repertoire of knowledge and concepts already existing in the person's psyche. Consequently the quality of learning is characterised by one's repertoire i.e. awareness, experience, practice and motivation that engenders the learner's active involvement (Asyali et al 2007).

Sitting in a class and listening to the lecturer is a passive form of learning. Learning in this form can be enhanced if the student gets involved in making connections with other ideas and experiences, creating new concepts or modifying the existing ones thus enhancing cognitive activity. More active the student is through conjecturing and making connections between ideas more academically engaged or involved s/he becomes with learning process (Hein 1985; Hockings et al 2010). Personal learning style of learners (concrete v/s abstract learners), complexity of material being presented, teacher's style and approach to teaching and general fluctuations in concentration level in the classroom setting influence the extent and duration of such involvement in learning. Quoting a study by Hartley and Davis it is

stated by Felder that the students were found to recall about 70% of the contents presented during the first ten minutes of the lecture and 20% of the contents of the last ten minutes (Felder 1994).

Extent of learning is affected by the students' own perception about the fundamentals of learning and division of tasks between them and teachers (Stern 1997). Learning is affected by the types of goals they set for their learning e.g. goals as passing examinations or achieving higher awards as against deepening understanding and acquiring skills (Brown 1999; Zimmerman 2002). Models of assessment and their perception by the students influence students resorting to either surface or deep learning. Some students like doing what they are already comfortable with from their earlier studies and would resist divulging from that and feel uneasy when the new information is presented in a different way or change is made from passive to active learning (Brookfield 2006).

4.3 Enhancing Learner Involvement

Techniques allied to 'student-centred' learning are more successful not only in the transfer of knowledge but also in longer retention of knowledge in comparison to the traditional teacher-centred approach to teaching/learning. Learning procedures and environments that allow the learners to talk to put forward their views, listen to other's views, reflect, justify and agree for reaching comprehension of concepts and their application to problem solving exercises are active learning methods which promote deep learning (Meyers & Jones 1993). Some of the teaching techniques that keep students engaged in the process of learning are characterised as group based learning methods under the broad name 'collaborative learning'. In this kind of learning process the students are essentially required to actively involve themselves, in small groups, to seek relevant information on a particular subject matter, query or a problem. They are required to actively engage themselves to discuss, reflect, explain own understanding, and question others' conclusions to comprehend the intended concepts or look for solutions depending on the preset targets of learning. Unlike teacher-centred approach to knowledge transfer in large a class room, active involvement of students is assured as their dissociation from the learning activities is easily noticed by the peers who need contribution from each other in the learning process.

The onus of learning is on the students and they are responsible for their own learning. This engenders an intrinsic motivation in them for their active participation and own success which is linked to the success of their group. Feeling of achievement and ownership of learning process are very strong motivating factors in the process of learning and the likelihood of these is more pronounced in the collaborative learning atmosphere. Such an approach, based on the theory of constructivism, not only creates conditions for deep learning during institutional education but also helps the students in developing skills for continual

learning during their professional careers, that demand skills for collaborative work, effective communication and teamwork (Noble 2000).

4.3.1 Collaborative learning

Collaborative learning is an umbrella term that encompasses a variety of small group educational approaches in which students collaborate face to face, applying their intellectual efforts jointly to search for solutions, constructing meanings or creating something new with the information and ideas (Smith 1992; Stern 1997). The basic tenet of collaborative learning is in concert with 'Cooperation is better for productivity than competition or individualisation for all but rote decoding tasks' (Johnson et al 1981). Some of the names given to this form of teaching/learning are collaborative learning, cooperative learning, collective learning, learning communities, simulation, role play, peer tutoring, peer learning, reciprocal learning, team learning, problem based learning, study circles, study groups and work groups (Davis 1993; Johnson et al 2000; Barkley et al 2005; Leberman 2006).

4.3.2 Cooperative learning

Cooperative learning is most widely used method and is applied in the primary, secondary, post secondary and tertiary education level in the USA and some parts of Europe. In comparison to the method that goes under the name of 'collaborative learning' the 'cooperative learning' format is more structured and comparatively closed ended as far as the outcomes of learning contents are concerned (Barkley et al 2005). This format of teaching/learning distinguishes from others on the basis of following five elements (Felder 1994):

(i) Positive interdependence – team members rely on one another for success, 'float or sink together';

(ii) Individual accountability – each is accountable for his/her share of work and mastery of all the material to be learnt, 'no hichhiking';

(iii) Face-to-face promotive interaction – teaching and encouraging each other through reasoning, feedback and challenging conclusions;

(iv) Appropriate use of collaborative skills – students develop and practice trust building, leadership, decision making, communications and conflict management skills;

(v) Group processing – setting up of group goals, periodic assessment to identify changes necessary to function more effectively in the future

These elements foster deeper understanding of all group members irrespective of their level of existing knowledge as even strong students while explaining finding gaps in their own understanding. According to Johnson, Johnson and Smith quoting 168 comparative studies involving students above the age of 18 years, there was substantial improvement in

grade scores from 50 percentile to 69 percentile when learning collaboratively (Johnson et al 2007).

To achieve agreed objectives and to raise the standard of the group as a whole all members feel obliged to contribute. Compared to the teacher-centred approach there is a lower level of anxiety and stress. Some students feel comfortable to explanations from peers as compared to the teachers. They develop more positive attitude towards subject areas and have higher self-esteem.

The students develop more positive and supportive relationship with fellow group members. Interaction amongst students helps them to know themselves as well as their peers from the standpoint of academic strengths and weaknesses. Such interactions are of particular value to seafarers who during their shipboard professional life have to deal with persons of disparate cultural backgrounds, varied educational levels and of different nationalities speaking different languages. They become aware of the lacunae in their own power of expression. Such realisation provides an impetus to the learners to garner efforts for their self improvement on this area vulnerable to conflicts.

4.4 Impediments to application collaborative techniques

Number of variations within the cooperative learning domain such as Student team-Achievement Divisions; Team-Games-Tournament; Jigsaw; Team Assisted Individualization; Learning Together; Group Investigation etc. have been used which may perhaps indicate a significant level of its use. However outside the US the implementation of such techniques at the undergraduate and graduate level is still unknown especially in the technical education, and particularly so in the field of MET.

Since its initiation over eighty five years ago this technique having gone through the assessments and valuations by researchers has acquired mixed response. One reason is perhaps its flexibility of structure generating a wide variety of applications and perhaps losing its specificity with many unable to differentiate between group learning and teaching students by seating in small group (Johnson et al 2007). There is also scepticism about its success in view of new and untried system.

If the existing curricula or a portion of it is selected for delivery through collaborative techniques, the structure needs modification as the process is more time consuming than traditional class room lectures. This aspect itself is an impediment in view of the large volume of syllabus that the teachers are required to deliver in specified time which is always short. An efficient implementation needs planning for delivery, thus extra work on part of the teachers, though only initially, nonetheless inimical.

Assessment of learning and evaluation of the learning process is an important aspect of course delivery. In the group learning activities assessment of both the level of learning

achieved and the extent of contribution of each student is essential for awards of individual grades and grading of groups.

Group learning is characterised by active participation and contribution of individual members. Potential of their contribution heavily rests on their skills, aptitude and attitude towards group learning process. Prior development of these attributes is essential.

4.5 Application to MET

MET is characterised as technical study and as against art and humanities subjects is founded on the scientific facts and principles. Although for learning of scientific facts the principles of collaborative learning can be applied but the time and efforts required for transfer of such factual knowledge outweighs the benefits.

The incumbents to the MET are fledgling adults who during their studies at the secondary school level, in all likelihood, have been used to the rote learning and would have had no or minimal exposure to group learning activities. If collaborative learning techniques are to be implemented the students need to be suitably and gradually prepared for it during initial MET process so that collaborative learning techniques can be implemented when they have completed their foundation studies e.g. scientific theories, working principles etc. and are in the process of learning the shipboard engineered systems, their operation and management.

Although group activities are used in practical training processes these courses are more like 'small group training' in traditional ways. However some specialised training on simulators specially designed to make the students collaborate in novel situations would qualify for this type of learning and will be best suited in the later part of the academic periods.

Most important resources for the success of collaborative learning process are the teachers. MET teachers who are old maritime professionals may have limited exposure to teaching and learning processes and may believe in delivering knowledge the way they acquired it. They would need an exposure and training to develop right attitude towards implementation of collaborative learning process, training in group learning techniques including setting objectives, implementing collaborative learning procedures, providing guidance to groups, techniques of leading the process.

5. Conclusions

Competence of seafarers is responsible for nearly one fifth of the major maritime accidents. Seafarers need to acquire comprehensive understanding of technical facts through active learning processes that enhances deep understanding of scientific as well as social concepts and help develop technical, cognitive and social skills. Skills for group/team work,

good communications and resolving issues are as essential because they have to work in such environment. For developing social skills the traditional teacher-centred class room lectures method is not ideal. Transfer of learning is contextual, it is easier if the learning takes place in similar environment. Learning process for seafarers does not end with the formal pre-sea MET but continues during professional careers. Group learning processes while requiring learners to involve themselves in critical thinking also develops their learning skills and make them lifelong learners, and may motivate them to continue learning through collaborative process during professional career for mutual benefits of professional colleagues. Suitable adjustments in the curriculum will be needed for implementation of group learning techniques. Success of its implementation will depend on the expertise and positive attitude and calls for specific training of the teachers in the aspects of collaborative learning process. f

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The Perception of the Value of Higher Education Amongst Tanker Officers

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Abstract

Current international maritime legislation requires professional qualifications to be attained, in order for seafarers to be employed as senior officers on merchant ships. There is no requirement for higher educational qualifications to be held by these staff. Nonetheless, it is apparent that many officer employees are conscious of the desirability of possessing recognised educational qualifications. Several have, entirely voluntarily, taken steps to advance their higher education simultaneously with their sea-going careers. This is not a new phenomenon but an opportunity has been taken to gauge current attitudes toward the matter.

The paper has been composed as a result of empirical research from a random sample of sea-going officers, whom have attended the Specialised Tanker Training Programmes at Warsash Maritime Academy, since the autumn of 2009. A sample, consisting of 61 course participants, was asked if any had undertaken, or had considered undertaking, higher education study. Of these, 21 had indicated such a preference and were then presented with a series of ten open-ended questions. The results of this survey are presented in this paper and the rationale behind their answers discussed. The paper has also endeavoured to place the findings within the broader context of on-board quality and resource management within the shipping industry.

Key words: Career Planning Higher Education Student Motivation Quality Management

1. Introduction and the Rationale

In the UK the option of taking a bachelors degree as part of a professional qualification, for sea-going officers, is a relatively new one. Foundation Degrees, as they are known, for deck and engine room officer trainees have only been around for 5 years or so. In fact, qualifications attained by trainees had traditionally been exclusive to the Merchant Navy.

With few exceptions, it was only in the 1970s and 80s that these professional qualifications had started to include some elements of more universally recognised educational qualifications, such as Ordinary and Higher National Certificates and Diplomas. Even then, examinations particular to shipping had to be attained in order to receive the appropriate certification. These shipping exclusive elements were regulated and monitored by the flag state administration whilst the other elements were regulated by broader national educational authorities. The current STCW (Standards of Training Certification and Watch keeping) legislation, despite its perceived frailties (McCarter 1999), stipulates no requirement for higher educational qualifications for seafarers.

This has not necessarily been the case in the wider world, where Merchant Navy apprenticeships, training and qualifications have long been associated with degree programmes, India being an example.

The reason why the UK flag state administration has avoided the requirement of higher educational qualifications in the past, is a matter of speculation. Maybe the shipping industry was after staff with a particular aptitude, whom chose not to go to university, 'doers' rather than 'thinkers'. Certainly the academic requirements to be recruited by a shipping company were by no means as rigorous as those for a university. This issue was addressed implicitly during this survey.

There certainly appears to have been a perception that the UK method of Maritime Education and Training is acceptable (Carruthers 1993);"Training of marine crews that is thorough and up to today's prevailing standards is available in the UK and in Europe. UK crews may receive adequate training, but the consistency of education offered by other countries is questionable".

Nevertheless, it is still quite possible to rise to senior ranks in the Merchant Navy without any form of higher education degree. Therefore a quite reasonable question might be if a degree qualification is not necessary in order to achieve this, why would anyone voluntarily put themselves out to gain such qualifications, whilst progressing through a sea-going career?

It is on this basis that the small survey was carried out. Clearly, as can be seen from some of the answers, the notion of higher education is important to the career aspirations of a number of respondents.

Aside from the objectives of the survey, another pertinent question might be related to why such technical mechanisms as cargo ships do not require degree qualified staff to operate. Considering the wider context of the skills required to operate these machines and indeed, manage the on-board teams of staff, would it not be rational to require a degree level of education?

These were the points raised in the survey questionnaire upon which significant credence is based. This is largely due to the apparent dearth of literature pertaining to the perception of maritime education and training (MET) of ships' staff.

It is not difficult to identify literature related to the subject of MET or even initiatives to reduce accidents aboard ships, especially tankers (Wang, Zhang 2000).

Yet the effectiveness of the MET delivered has rarely been analysed and the related literature has, until comparatively recently, tended to concentrate on studies reactive to accidents and incidents, rather than pro-active in terms of avoiding such incidents. As Squire (2005) points out there is also in shipping operations "the need for operators to maintain the competitive edge".

The aforementioned STCW regulations first appeared in 1978 but did not include any requirement for mandatory non-technical training (Crisis Management and Human Behaviour) until its major overhaul in 1995. Once again, the emphasis is on emergency situations. Yet very little emphasis seems to be placed upon efficiency and knowledge management. Akerde (2009) maintains that knowledge management and quality management are unrelated and that "their interaction has not been fully explored"

This is a view shared by the author, though (Celik 2009) argues that quality and safety management systems may be assessed together. However, quality and safety management systems in shipping tend inevitably to refer to accident avoidance rather than efficiency (Pun, Yam et al. 2003). The phrase Total Quality Management appears to have escaped the shipping industry, as far as ships' staff are concerned, though I cannot find a plausible explanation why (Powell 1995).

In order to interpret and enhance the legislative requirements of the STCW Convention, the International Maritime Organisation (IMO) contracts tasks out to commercial consultancies to compose 'Model Courses'. Though there may be a mandatory condition for sea-farers to successfully complete many of these courses, the detail and methods of running such training courses may still be open to some interpretation.

Bahtt (2009) talks of the model courses as "prescribed minima" rather than opportunities "where higher standards can be applied". It is this very point that this small survey was endeavouring to address.

Another term commonly banded around the industry, which appears to encapsulate the narrow minded approach identified by this paper, is this 'culture of compliance'. It infers that compliance of the "prescribed minima" is all that is necessary for ships to operate safely and efficiently. Yet in a commercial environment, safety alone will not guarantee commercial success. It is the efficiency, though not at the expense of safety, which will manifest a commercially competitive enterprise.

Hitherto, it seems the topics of quality management have been purely in the domain of the head office of shipping companies, or their contracted management companies. What does quality management mean to ships' staff? Is it the same as safety management?

The International Safety Management ISM Code requires a company Safety Management System, with the emphasis, reasonably, on safety and the protection of the environment. Speak to any sea-goer and they equate this form of 'quality' with filling in

checklists. But what does the 'customer' look for in terms of quality? Not simply compliance with regulation. Who are the customers, in this context? They are the cargo owners or charterers. They are looking for such qualities efficiency, attention to detail, reliability and confidence. These qualities are not generated by legislation alone.

It seems to me that when so-called quality systems such as the ISO standards were developed, only selected parts were applied to the function of ship staff, whilst the business of managing the financial prosperity of the ship was left entirely within the domain of head office management staff. Yet which group of company staff actually operate the ships? Chan et al (2002) tells us that"Adopting the ISO 9000 standards, the QMS provided a framework for the Corporation's quality, safety and environmental management systems, linking and standardizing all work processes from the top management down to the shopfloor", when speaking generally about Quality Management.

Willoughby & Wilson (1997) echoes the sentiments of just about every STTP Course delegate I've spoken to over the last 12 years whom have asked."Some practitioners maintain that the main problem with introducing a quality management system such as ISO 9000, is the amount of paperwork required to maintain it. Many believe it is purely a bureaucratic paperwork exercise and managers are so busy chasing paper that they do not find time to concentrate on genuine quality and business improvement",though he is speaking specifically about his colleagues within the motor trade. So the core of this small survey was to determine the perception of the value of higher educational qualifications amongst cargo ship, specifically tanker, staff. Do the ships' staff need higher education in order to understand how quality systems work on board?

2. Why tanker officers

The reason why tanker officers were chosen as the source of data is simply because these are the sea-going staff I encounter routinely in my work. I considered them eminently suitable as a data source because of the technological nature of their craft. Similarly the high risk nature of their cargo work in respect of the environment, meant that as soon as the ISM regulations were introduced into the industry, tankers were amongst the first ship type to have to establish a documented and approved SMS. Without question quality is required in terms of the approach to tanker work adopted by their crews. By 'quality' in this context (Hackman & Wageman 1995) I mean attention to detail, effective communication, leadership, decision making and the willingness to check and double check each action. Which part of the ISM Code deals with these 'qualities'? I'll tell you; none. It is of some bewilderment to me that business concerns are rarely discussed in the arena of the seafarer; it is kept in the domain of the head office ship managers.

Yet, as mentioned earlier, who operates the ships? Why cannot quality management be utilised in the same commercial context as do other transport industries, as cited by Thai (2008).

My own experience of tankers led me, erroneously, to believe that these were by far the most challenging type of cargo vessel to work. The dexterity of eye and aptitude required to maintain control of the loading, carriage and efficient discharge of a bulk liquid cargo, incorporating safety, environmental sensitivity and cost efficiency seemed more difficult than the same concerns could possibly be on any other form of cargo vessel. Further experience of my own demonstrated that this was not so. It is commonly accepted in the shipping trade that each type of cargo bears its own characteristic challenges and that those provided by tanker work are not necessarily more or less taxing than other forms of cargo. However, the nature of concerns, whilst working a tanker, are significant enough in variety and magnitude to require very capable individuals and teams to manage them. One core element of this survey, was to establish whether the capability of these individuals could be measured in terms of academic ability, related to higher educational aspirations. Bonsall even espouses a Graduate Skills Initiative in association with the well established work-based learning in a Merchant Navy apprenticeship. More specifically, though the point is related to training and education more than 'higher education' the acquaintance of the participants with being trained or educated, was perceived to be of significance at the outset.

3. Methodology

A short ten questionnaire was handed to those respondents who had undertaken, or who were considering undertaking, higher education. Whilst the questionnaires were being completed, discussions were held and further details related to subject areas of study were noted.

In a sense, a triangulation methodology was adopted, rather than setting out to quantitatively analyse a series of ranked questions, the questionnaires were used as a guide for an informal semi-structured interview. However, simple quantitative results may also be gleaned from the survey. Results were noted rather than recorded, the intention being simply to gauge opinion rather than be mathematically analysed. The benefit of this was to engage discussion, though the limitations of this approach meant that the responses were not explicitly recorded. The methodology chosen appeared to engage the participants whom were willing not only to describe the rationale behind their decisions but to reflect on them as well.

4. Limitations

Though not explicit in this small research pursuit, the author could not help but feel an ethnographic association with the participants, bearing in mind his own industrial experience mirrored many of them.

Yet perhaps it is this very idiosyncrasy which undermines the chosen methodology, where the participants' answers were given an individual interpretation by the interviewer, as opposed to the meaning intended by the interviewee. Furthermore, the interviewees may have chosen to answer the questions in terms of what they thought the researcher was after rather than their genuine views - perhaps a form of Hawthorn effect (Robson 2002).

One must also take into account the possibility that some delegates may not, for whatever reason, wished to discuss their educational aspirations. Therefore the statistics declared here merely relate to those staff who chose to declare their interests.

5. Ethics

With entire classes present, during the various STTP courses, the researcher requested those delegates who had undertaken, or had considered undertaking, higher educational study to indicate themselves. A number of points were made by the researcher at the time, in the interests of ethical procedures;

a) the nature of the survey, being purely on the premise of empirical research

b) the fact that identities would be protected, in fact not even noted

c) that delegates who had not chosen higher education were by no means compromised by the decision

d) that only the nature of the study and the rationale behind the decisions to study at the higher educational level would be recorded

e) that a standard university research ethics document had been completed and signed for the purpose of the survey

The response of the delegates was encouraging though point c above had to be emphasised during a number of classes. It was also apparent, as inferred earlier, that once the individuals had been identified and spoken to in small groups, they were extremely open and willing to discuss their plans and perceptions. It was partly for this reason that the methodology of open-ended questions prompting semi-structured interviews, was chosen. It was anticipated that once started, interviewees would be willing to elaborate on the topic, therefore a purely statistical, quantitative analysis was rejected.

6. The Questions and Qualitative Analysis

1) Have any of you started or considered starting under graduate or post graduate study?
   21 course delegates of 61 questioned responded YES = 34.4%
2) What has been the purpose of this consideration, toward a career away from the sea?

20 of 21 respondents intended to remain within shipping = 95.2%

3) If so, work associated with shipping or not?

20 of 21 respondents intended to remain within shipping = 95.2%

4) Will you leave the sea to complete this study?

16 of 21 respondents expected to be able to study whilst at sea = 76.2%

5) If undergraduate, would you consider progressing to postgraduate study?

18 of 21 respondents said YES = 85.7%

6) Is the idea of distance learning options important to you?

18 of 21 respondents said YES = 85.7%

7) Do you see the value of obtaining graduate / postgraduate qualifications whilst still at sea?

18 of 21 respondents said YES = 85.7%

8) Or in associated work, that is, shipping related?

20 of 21 respondents said YES = 95.2%

9) If you have, or have embarked on a Foundation degree, did you see this option as attractive?

3 of 3 respondents who took a Foundation Degree said YES = 100%

10) If on an HND programme, does your sea-going career path appear clear without the need for graduate study?

15 of 15 respondents who had taken an HND as part of their apprenticeship said YES = 100%

7. The results

Of the 21 course delegates over the period specified, who declared their activity in higher educational study, it should be stressed that three of them were on or had been on, a Foundation degree programme. The implication of this is that having left school and considered a sea-going career, a degree programme was offered as part of the apprenticeship, rather than the three individuals choosing a degree as an additional option, as others had.

The completed questionnaires have been appended to this paper and rather than analyse them purely statistically, the author has chosen to take a more qualitative approach toward their analysis.

One striking impression from every single respondent was that it was not considered necessary for higher educational qualifications to be gained in order to attain senior rank in the merchant service.

No flag state administration requires this anyway and it was clear those respondents who were satisfied with their career outlook were conscious of this.

However, another striking factor was that each of the respondents was also very conscious of the idea that they may not stay at sea for the duration of their careers. Despite their apparent current enthusiasm, many used the words 'value' in association with their professional qualifications in comparison with higher educational qualifications. It was felt

that even Foundation Degrees, did not bear much 'value' and that a wise move would be to 'top up' such a qualification at an early opportunity to 'honours' level. The word 'insurance' was also used by a number of respondents, in terms of having more widely recognised qualifications than their existing professional certificates, in the event that they chose to leave their sea-going careers at a later date. However, several emphasised that the attainment of their senior professional qualifications was more important to them than graduate or post-graduate study at the time.

Several also recognised the value of post-graduate qualifications and expressed an interest, if not firm plans, to continue in such study. One experienced seafarer had attained a postgraduate degree whilst in the military in an earlier career path but valued the qualification even though his current work was apparently secure. Two others had enjoyed the sponsorship of the military again in earlier career paths and also valued then at their current stage in their respective careers.

One other noticeable feature was the perception of distance learning facilities whilst on board. Most respondents made it clear even as a junior officer, they find little spare time whilst on board their ships at sea. So the idea of distance learning facilities would be of little interest to these staff. More than one respondent claimed that a year or two away from the sea, to study full time, would be of more practical value to him, than the option of distance learning facilities on board.

Predictably and perhaps in line with the celebrated Hawthorn effect (Robson 2002), one respondent explained that rather perversely, in the light of this survey, he saw his current sea-going career as a means of enhancing a different, yet to be selected career, away from shipping. Whilst higher education would play a significant part in his future career aspirations, he had no intention of prolonging his sea-going career path as soon as a suitable alternative career opportunity came up ashore.

8. Interpretation of the results

One characteristic that is abundantly clear from the survey is that none of the seafarers questioned believed that higher education was required for a career in the Merchant Navy. At least two of the respondents had sailed in senior positions at the time of the survey and for what it's worth, this fits in with my own interpretations. More relevantly to the core of the survey is that these staff and in some cases senior staff, do not believe higher education is necessary in order to maintain quality system management on board a commercial cargo ship.

The rationale behind the choice of taking higher educational study is also salient, in the vast majority of cases, as 'insurance' and added 'value'.

A consistent sentiment was that these seafarers did not feel their existing professional qualifications bore much universal 'value' as a graduate or postgraduate degree.

This leads into two further points related to the issue. Firstly, the 'Extra Masters' and 'Extra Chief (Engineers)' qualifications, the highest possible professional certificates, have disappeared from the UK flag state administration portfolio. This was largely, reportedly, as a result of such a low uptake of this option and this leads into the second relevant point. There appeared to be a feeling amongst the more educationally ambitious seafarer that 'Extra Master's and Extra Chief's' certificates had little recognition amongst shore side employers, rather like the less senior certificates.

Therefore the perception amongst seafarers appears to have been that if they are going to put the effort in to study for an Extra Master's or Extra Chief's certificate, they might just as well study for an under graduate or postgraduate degree. They would require to devote arguably less effort but have a more universally recognised qualification afterwards.

There is another related point to be made. Not every apprentice in any department joins the Merchant Navy in order to reach senior rank status. Employers expect a percentage of staff to leave their sea-going career before gaining promotion to a senior rank. As this survey has suggested, many respondents seriously consider leaving the sea but continuing in a shipping related capacity. This is the very rationale upon which Foundation Degrees have been offered as part of an apprenticeship.

9. Conclusions and suggested further study

It is clear that a significant percentage of seafarers think about there careers in the long term just as much as their short term employment. Otherwise, there would be no reason to go to the expense and effort of entering into higher educational study.

Bothe employers and educational establishments have anticipated this by offering a Foundation Degree within an apprenticeship. In a sense this might be interpreted as being somewhat fatalistic, conceding that a company's expense on training would be wasted on staff they know full well will not continue as a seafarer. However, another interpretation may be that with such a degree in their possession, individuals would continue within the industry and not be lost to it. That in itself, would be an achievement.

A useful further study would be to examine shipping company staff, whom have perhaps taken the decision to leave the sea in the past, in order to determine how they saw their career path during their apprenticeship.

The perception of the value of higher education would also be of interest in association with the survey described in this paper.

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Author's Biography

Quentin Cox stared his sea-going career with BP Tankers, rising from apprentice to Chief Officer. After brief interludes on other forms of cargo ships, ferries and dredgers, during which time he sailed as Captain and a spell as a consultant (vetting and cargo

expediting) he entered academia. As a Senior Lecturer at Southampton Solent University he is now involved in the management, development and delivery of postgraduate programmes in addition to tanker training. He attained his Master of Arts in Open and Distance Education in 2003. He has had conference papers delivered at the Royal Institution of Naval Architects (2004), the International Maritime Lecturers' Association (2008 and 2009) and the International Association of Maritime Universities (2009). He has also co-authored a technical book on oil tanker safety and operations, due for publication in 2010 by Brown, Son and Ferguson.

Innovation and Practice on Multiplex Personnel Training Pattern for Marine Engineering

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Abstract

At new era, reform and innovation of person cultivating pattern for marine engineering is not only the need of student meeting with the development of modern shipping, but also the need of student entering into society. Basing on analyzing a great deal navigational education data and investigation and research deeply into ship companies, combination with near one hundred maritime education experience and advantage in our university, person cultivating pattern for marine engineering is designed and constructed innovatively, then put into use. The further strengthening and improving measure is analyzed since the mode is implemented and used, and fruitful results that have been achieving are cited.

Key words: Maritime education and training (MET); Marine engineering; Personnel training pattern; Practical skill; Reform and innovation.Maritime Education is a distinctive feature of maritime personnel training mode, which combines education and vocational education degree of the dual nature of economic links with the industry very closely, has a strong international exchange of. The implementation of STCW 78/10 Convention, the International Seamen's booming labor market and the prosperity of the shipping industry development, as well as to large ships, intelligence, information technology, automation direction for reform and innovation in the educational system of navigation provides a good opportunity. In order to meet the domestic and foreign seamen market characteristics on the composite category of high-level marine engineering and technical personnel of the new requirements, as well as our school, "rely mainly on teaching to undergraduate education, to foster an innovative spirit and practical ability of the application-oriented talents based efforts to serve the local economic construction and social development "orientation, maritime education to achieve a smooth and seamless talent market, the innovation system and mechanism for maritime education and training of high-quality composite marine engineering talent is the crux of the matter for a major maritime training institutions.

1. Marine Engineering and Technical Personnel Training Status

1.1 Analysis of personnel training at home and abroad

Based on the analysis of relevant information for higher education reform in the United States, the training focused primarily on the reform and innovation of general education courses, the curriculum system the universities is optimized and recombined of its basic features:

(1) To build the concept of general education.

(2) Integration, penetration and formation between curriculums.

(3) The internationalization of the curriculum reflects in the teaching content and curriculum system in international, as well as to enhance international awareness of students.

(4) Market-oriented curriculum, professional and curriculum setting of the university forward to meet the needs of the market.

China's higher education since the beginning of the last century 90's reforms, but so far, most colleges and universities are still far lower than the proportion of elective courses in Europe and America, and the stiffness of the credit system is still too large, the students can not be fully in accordance with their interests and freedom of choice will of course expand the academic knowledge.

1.2 China's maritime education and training analysis

According to the Chinese maritime strategies, as a result of the specificity of training, evaluation of competence, practical, international and maritime training institutions in respect of program and curriculum reforms carried out and practice, the main measures:

(1) Undergraduate education in accordance with maritime properties belonging to engineering education, combining the specificity of vocational education, are taken in general use for the kind of education, the Ministry of Education in accordance with the requirements of the engineering curriculum; academic kind of education in accordance with the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended in 2010 (STCW 78/10 Convention) and the state Department of Transportation" the rules of examination, assessment and certification for qualified Seafarers", The 7 function modules are designed for the requirements of navigation technology, marine engineering course system, and marine engineering professionals focused on "Marine Engineering", "Ship Operation Management and Personnel Management", "Electrical, Electronic and Control Engineering" and "Maintenance and Repair" four function block request, set up the basis of professional courses, professional courses, professional elective courses, elective courses, as well as the professional practice of public education system to meet the requirements of competence for the crew.

(2) The practical teaching of the total credits is more than 35 percent to meet the needs of the practical kind of navigational education.

(3) Some colleges and universities to carry out professional activities in bilingual education programs to meet the training needs of the international.

(4) The majority of public colleges and universities in the professional basis of elective modules, set up international shipping, cross-cultural, environmental protection courses to meet the needs of multi-national crew exchange, the demand for protection of the marine environment. But have not yet carried out a complex dual professional training model of education.

1.3 Maritime training in marine engineering technology analysis

According to the China Ocean Shipping Company (COSCO) underling the ocean-going company, China Shipping Group (China Shipping) underling the various shipping companies, shipping companies well-known Hong Kong, China Oilfield Services Limited (COSL), China Petroleum & Chemical Group Corporation (Sinopec) and other large shipping companies, as well as the crew some well-known company's research services, in the new development opportunities, the quality of the crew of the enterprise of the new requirements, how to achieve maritime training institutions and enterprises employing seamless connection required as well as personnel training programs compound to seek the views of the employers, they agreed that: With the increasingly larger ships, intelligent direction, not only to understand the needs of both electrical and mechanical equipment operation and management, and strong capabilities in the practice of marine engineering talent, also called turbines engineers to understand economic, legal and management expertise, also called marine engineering personnel to master the international current language and understanding of world culture, with appropriate cultural background of multi-national crew of the exchange and integration work.

Marine engineering collecting machinery, electricity, hydraulic, information, control, management and other disciplines of knowledge, if students in other aspects of language ability, maritime law and shipping economy have been further enhanced, will be much-needed demand for application-oriented talents in line with the shipping company. Based on the above understanding, to build a wide range of personnel training programs, dual-professional training complex navigation model is the new trend of development of education to meet the social development of marine engineering personnel requirements.

2. Innovation and Practice of Complex Marine Engineering Professional Training Patterns

2.1 The target of complex marine engineering professional training patterns

Marine engineering professional training model compound goal is to strengthen the basis of practical skills and training work with a solid theoretical knowledge and ability, in line

with international maritime conventions, training specifications, a solid grasp of the basic theory and the basic skills of the four major functional modules, such as "Marine Engineering", "Electrical and Electronic and Control Engineering", "Operation of Ships and Personnel Management" and "Maintenance and Repair", with a multidisciplinary application of knowledge and strong engineering capability and innovative capability in the operation of ships, shipyards, and ports, ships, testing, manufacturing and other related enterprises and institutions engaged in operation and management, equipment maintenance, engineering supervision, inspection, technology development, project management, etc..

2.2 The basic content of complex marine engineering professional training patterns

According to above training objective, launched the experimental zones to strengthen the practical ability and innovation capacity for complex marine engineering professionals". Innovative design and build an experimental zone for the training of basic education in the three-tier platform chain, that is, "liberal and practice platform", " disciplinary education and practice platform" and "integrated platform for education and practice". Ability to practice the main line, in the disciplines of education and practice of parallel platform equipped with "multi-import and multi-export" of the disciplines of education "package", that is "double-professional package", "strengthen the professional course" and "strengthen the course of employment."

2.3 Implement of complex marine engineering professional training patterns

2.3.1 General education and practice platform

According to technology training and application of common features, mainly to build enough structure of scientific knowledge of the humanities and social sciences, natural sciences, languages and information technology and economic management, in order to provide the necessary academic education based on theoretical knowledge and to train the basic practical ability for students. Education platform for the practical teaching credits accounted for 25%. By the Institute of Sciences and the Institute of Foreign Languages assume the teaching work of basic knowledge, and the department of teaching is responsible for coordinating the management of the Registry.

2.3.2 The education of subjects and practice platform

The main platform for professional education and practice is the parallel configuration of the “multi-import multi-export” of the education of disciplines “package” that is “double professional package”, strengthen the professional course and strengthen the course of

employment.

(1)Dual-professional course

By the Foreign Languages Institute, Institute of Navigation, Institute of Finance and Economics, School of Business and Management is charged with teaching, then the department of teaching is responsible for coordinating management. The first semester of sophomore year, all access to the professional marine engineering students in the first year after the end of the study, all the theory examination for more than 70 scores practice teaching and assessment of successful applicants will be based on their interests and choose The second elective studies, and provides precise attitude in the 3-5 years more than 90 credits can be made the second professional diploma.

(2)Strengthen the professional course

Focus on the design of the turbine ship operation, the turbine operation and management modules on project management, focusing on the ship electronics, electrical equipment, project management, electrical and electronic modules, focusing on machines built project management module, as well as repair works focus on shipping, maritime exchange of language ability Marine Intensive English module, any student may be according to their own will and interest in his sophomore year after the end of the first semester junior 1-2 early elective learning modules.

(3)Strengthen the course of employment

Students learn in the third after the first semester to the beginning of a senior, combined with the will to choose their employment, "the direction of the sea" or "land-based direction." Choose "the direction of the sea," the students, according to the latest China Maritime Safety Administration (China MSA) issued the rules of examination and assessment requirements, to conduct a series of intensive training, after examination and after passing the assessment, but also to complete the 12-month internship at sea, with the guidance of engineers on board assessment of qualified certificate of "Third Engineer" unlimited navigation area access to 3 000 kW and above. Choose "the direction of the land," the students can choose to join the theoretical test subjects and to pass the evaluate project by China MSA, then to obtain a certificate of competency; also can not participate in examination and assessment, through enhanced professional practice in "the automation marine engine room", completed at least one month internship graduate, and graduated from the university of the completion of technical reports, under the guidance of mentors at the same time to complete the design or the graduation thesis.

2.3.3 An integrated platform for education and practice

Include the provision designed to improve students interpersonal relationships, moral quality, artistic accomplishments, as well as elective courses in order to comply with the development of the times, and the innovative practice of extra-curricular activities in science

and technology platform for the students according to their own interests and abilities, participate in a variety of innovative practice of extra-curricular, academic and scientific and technological activities, arts and sports activities, students actively explore the awareness of creative thinking and innovation, and comprehensively improve the overall quality.

3. The Need for Further Measures Taken to Improve

3.1 Real-time training program amendments

In order to achieve personnel training programs suited to the rapid development of the status quo of the shipping industry and modern electrical and mechanical equipment, researches should be carried out on the shipping and shipbuilding industry needs of navigation, engineering and technical personnel trends, real-time to amend the main battlefield of economic construction of the marine engineering personnel training programs. Solid foundation for further professional courses, streamlining the professional courses to study the "marine engineering management", "electrical and electronic engineering", "ship & machinery repair engineering" and "strengthen maritime English" four professional elective courses and elective courses in the professional public settings, a problem of convergence.

Credit hours to reduce the theory of teaching, an appropriate increase in credit hours of teaching practice, build capacity-building to the main line, sub-level, multi-module. So that the practice of teaching more than the total 40% of credits.

3.2 To strengthen the content of the curriculum system and teaching reform

Content in teaching materials, and further optimize the system and curriculum programs, streamlining the teaching content, to delete old knowledge, the increase in new technologies, new techniques, new management knowledge points; practical aspects of teaching model, the strengthening of practical skills of students, the preparation of teaching programs, highlighting the practice of teaching, part of the backbone of the curriculum and practice teaching of the use of bilingual teaching, highlighting the appropriateness of self-willed personnel training and international characteristics.

3.3 Strengthen the practice of teaching content reform

Reform in the practice of teaching curriculum, teaching mode, the marine power equipment, electrical appliances and motor disassembly process before "marine diesel engine", "auxiliary machinery," "ship electrical equipment and systems" courses in order to facilitate students to professional courses to learn the knowledge and understanding points, while the "operation of marine power equipment," "operations of power plant and engine room

simulator," "electrical test" and "English listening and conversation" such as teaching the practice of operational arrangements to complete professional courses in the trunk after the internship before graduation, students help to strengthen interoperability and appropriate parenting skills and pass the evaluation of competence and examination test subjects of China MSA; set up to strengthen the professional capacity of course, as well as focus on the design detection capabilities, regulations and ship inspection, energy saving and pollution prevention, the ability of professional computer applications common elective courses, and strengthen the knowledge in different direction of the professional development.

Reform in the training base, strengthen students mechanical and electrical equipment of ships, marine management in order to lay the foundation for learning of professional courses; study the "normative assessment for marine engineering" promulgated by China MSA, and preparation of teaching materials aimed at the requirements of skills training to strengthen the practice of comprehensive training, to further strengthen the students ability to repair mechanical and electrical equipment disassembly, electrical and mechanical equipment to operate on duty capacity, and to strengthen the capacity of lathe work, benchwork welding operations and marine engineering English listening and conversation.

3.4 Strengthen the teaching of the operation and management mechanism reform

In addition to the continuation of 3 times teaching inspection, teaching supervision, class evaluation of experts and students, mentoring young teachers and teaching operational level competition per semester, the project activities continue to promote the teaching and research activities to enhance teaching in the management of closed-cycle (PDCA) process, quality control, especially the quality of teaching practice monitoring, further amendments to teaching practice navigation, marine comprehensive training, open labs, the practice of extra-curricular innovation, graduate internship with the Graduation Project (Thesis) regulations to establish interoperability strong teaching operation and management mechanism.

3.5 Students to build and improve innovative platform for extra-curricular

According to the school funding arrangements for the laboratory building, adding a timely manner new and advanced mechanical and electrical equipment of the ship to ensure the experiment, the practice of teaching equipment and modern technology to adapt the ship to improve the students qualified for future work capacity.

4. Conclusions

Under the new situation of reform and innovation in marine engineering personnel training mode, is sailing the institutions of higher survival and development of their own needs, but also human resources to meet the maritime shipping industry category of high-quality maritime professionals for the new requirements. Some achievements to strengthen practical skills for marine engineering complex mode of professional training, the practice show that the model is a successful model.

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Mamudu Abdulai–Saiku–Sustainable Development – The Shipping DimenSion

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ABSTRACT

Sustainable Development either as a term or concept has been surrounded by so many debate.Furthermore, different approaches have been proposed for the attainment of sustainable Development indicators.Various industries have either directly or indirectly indicated their roles and contributions to Sustainable Development.

The chemical industry, for example, has embraced cleaner production as a means of improving upon environmental standards and therefore supporting the concept of SUSTAINABLE DEVELOPMENT.

Shipping, one of the oldest industries, has over the years adopted several measures that contributed largely to prosperity and also maintained the integrity of the environment in which it largely operates. Basically this has been possible through compliance with International legislation, the use of modern technologies and sound environmental and safety practices.

This paper examines and synthesizes the plural and varied contributions of shipping to the concept of Sustainable Development.

1. Introduction

It is not an easy task to outline the history of shipping. This is because it can be written from different angles depending on either the interests or intention of the author and maybe those of the readers as well.

Some facts are however, indisputable:

For example shipping is one of the oldest profession/industry as testified by the Psalmist "They that go down to the sea in ships, that do business in great waters. These see the work of the Lord and his wonders in the deep" (Psalm 107:23)

Shipping carries over 85% of world trade. It is therefore the primary mover of world trade and therefore contributes tremendously in socio-economic development in the areas of increase productivity, job creation and poverty alleviation.

There has been a long technological evolution within the shipping industry – from the ancient wooden sailing ships to the current fully-automated ships. This development has been both positive and negative. It is pleasant to note that modern ships can carry very large quantities of cargo at cheaper unit costs. They can load and discharge cargo faster and carry it to its destination more efficiently. As a result of this development the potential to cause more harm to life, property and particularly to the environment has increased.

The role of shipping in the promotion of sustainable development can be assessed through the measures put in place by the various stakeholders. These include the International Community, National Governments, Industry players, non-governmental organizations and individuals.

2. Sustainable Development- Some Historical Perspectives

It will be difficult to establish with precision the genesis of the concern for the natural environment. For the purpose of this paper the author will like to begin with the UN Conference on the Human Environment in Stockholm in 1972 which was instigated by the UN Economic and Social Council (ECOSOC).

The major concern that led to the Stockholm Conference was initially the acidification of Scandinavian aquatic systems. When pollution became an issue, concerns of developing countries were taken on board. The result of the deliberations of experts identified the environment as a critical element of optimum development (Grubet al 1993). The dichotomy between Environment and Development was thus firmly established and that would eventually lead to the establishment and definition of the concept of Sustainable Development. The Stockholm Conference was by all standards very significant. It brought together representatives of 113 countries and 400 inter-governmental and non-governmental organizations. The Stockholm Conference had several significant outcomes:

1) The 26 principles that addressed major areas ranging from education and science, resource use and pollution took the environment in view

2) The action plan consists of 109 recommendation in three parts (i. global assessment programme, ii. Environmental management activities and iii. Supporting measures such as education and training (Grubb et al)

As indicated earlier the dichotomy between development and environmental degradation was projected and this to some extent created suspicion on the part of developing countries with respect to the intention of the developed world. Some thought it was a means to

prevent developing countries from progressing. Environmental protection was a luxury they cannot afford when the issue is about development. Unless the pollution will lead to serious human health related issues, the developing countries were prepared to pollute a little if only it will help provide food and employment and make life comfortable for the people. This position was succinctly articulated by Mrs Indira Ghandu, the late Prime Minister of India when she said at the conference, "The rich countries may look upon development as the cause of environmental destruction, but to us it is one of the primary means of improving the environment of living, of making deserts green and the maintains habitable. We do not want to impoverish the environment any further, but we cannot forget the grim poverty of a large number of people. How can we speak to those who live in villages and slums about keeping the oceans, rivers and air clean, when our own lives are contaminated at the source. Environment cannot be improved in conditions of poverty, nor can poverty be eradicated without the use of science and technology".

This is a rather long quote but is a perfect articulation of the views and concerns of the developing countries. It must, however, be stated that whatever position one takes, the Stockholm Conference is a significant milestone in the process of strengthening concern for the environment. It led to the establishment of national environmental protection agencies and/or ministries of environment. The United Nations Environment Programme was also created to sustain the environmental awareness generated from the angle of the UN System. It appears clearly that no one and nothing can stop an event whose time has come.

Even though the UN conference on Environment and Development took place twenty years after the Stockholm conference it can be described as the follow up to the 1972 Stockholm conference.

The conclusion of several arrangements such as the United Convention on the Law of the Sea, the Basel Convention, the Montreal Protocol, the International Convention on the prevention of Pollution by ships, from the 1970s to the 1980s kept the concern for the environment alive.

In 1982, ten years after the Stockholm conference, a special session of UNEP's Governing Council conclude that there was the need for a much greater long term and integrated environmental planning. The World Commission on Environment and Development (Brundtland Commission) was established to independently re-examine the critical issues of environment and development and to formulate innovative, concrete and realistic proposals to deal with them and to strengthen international cooperation on environment and development.

The World Commission on Environment and Development presented its report in 1987 under the title "Our Common Future". It is, however, most commonly referred to as the Brundtland Report.

The Brundtland Report proposed specific measures inter alia "to prepare under UN auspices a universal declaration on environmental protection and sustainable development and

subsequent convention to transform the report into a UN programme on Sustainable Development and to convene an international conference to review progress made so far and map out follow up strategies (Grubb et al 1993).

In spite of the apprehension RIO proved to be a successful event – there were fears that the summit was not going to be successful because of the indication of USA that it was not going to sign the biodiversity convention.

The UNCED produced five agreements, two of which were and still are in the form of legally binding conventions. These are as follows:

1) United Nations Framework Convention on Climate Changes

The objectives of this convention is to ensure stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adopt naturally to climate change, to ensure that food production is not threatened and that economic development proceeded in a sustainable manner.

2) United Nations Convention on Biological Diversity

This convention according to Abby Munson is to ensure the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

3) RIO Declaration on Environmental and Development

This declaration and its intention is to build upon the Stockholm Declaration of 1972, so as to achieve Sustainable Development. The commentary to this declaration by Koy Thompson summarised the significance of the 2 principles as putting human beings at the centre of concerns for sustainable development, restating the UN Concern on establishing the right for development for developing countries and their special needs and endorsing the importance of cooperation in capacity building and the clamour for the use of EIA

4) Agenda 21

As provided by Mattual Kock and Michael Grubb, Agenda 21 is the action plan for the attainment of sustainable development. It consists of 40 chapters and addresses:

- General issues of social and economic development
- General issues of specific national and other resources
- The role of different major groups
- Means of implementation

Agenda 21 as indicated is not a binding treaty but has a lot of weight.

5) Principles of Forest Management

Michael Grubb et al have described this as a document with something for everyone but without any clear message of direction. It emphasized the rights of Governments to exploit their own forest but also have the responsibility of ensuring that their actions do not affect other countries negatively.

3. Sustainable Development Defined

Sustainable development has been variously defined and explained. While sustainable development has become a term many do not actually understand what it means and how to implement it.

Pezzey has over fifty different quotations purporting to define or explain the meaning of Sustainable Development. The most widely accepted definition of sustainable development is the one provided by the Brudtland Report – our Common Future which states:
"Sustainable Development is Development which meets the needs of the present without compromising the ability of future generations to meet their own needs".

Following from the definition above one can argue that sustainable development is not new as a concept. It has been inherent in the traditions and practices of people, communities and nations. Credit can be attributed to WCED for the generation of the term but definitely not the concept and I present the underlisted in support of my assertion:

- The synoptic Gospels stale "Give unto Caesar what is Caesar's and unto God what is God's
- Islam proscribes the making of excessive profit because excessive profits discount the future
- The Mandige tribe of West Africa have this common saying "I have not inherited this earth from my parents, I have just borrowed it from my children".

These in my view are classical formulation of the concept of sustainable development.

4. Shipping and Sustainable Development

The CSD indicator themes of sustainable development include oceans, seas and coasts. The prevention and/or reduction of pollution is central to this indicator theme and a means of contributing to sustainable development. Many industries have pointed to their improvement on environmental standards as their contribution towards the success of sustainable development.

Shipping is one of the source of marine pollution but is has done a lot to prevent and/or reduce marine pollution – perhaps more than any other industry.

The SOLAS convention, though a safety convention has played a role in the protection of the marine environment especially in the areas of design and construction of vessels. The STCW convention has outlined key requirements in the training of seafarers for effective and efficient performance to prevent accidents and substandard performance that may lead to environmental impact.

The convention on the management of ballast water is not only about pollution but also about biodiversity and reduction in biodiversity loss is an essential element in the pursuit of sustainable development.

There are other conventions and non-mandatory arrangements which have not been cited but greatly contribute to the preservation and conservation of the marine environment and by inference the sustainable development concept.

In conclusion let it be stated that in terms of marine pollution prevention so much responsibilities is placed on shipping which does not contribute more than 10% of the total marine pollution complex. To date there is no single global arrangements on LBSMP, apart from the lip services paid to it in UNCLOS. Even in UNCLOS over 70% of the regulations on "Preservation and Conservation of the Marine Environment", dwell on shipping.

In any case shipping's contribution to the concept can only be enhanced because of the mechanisms of regularly and continuously updating regulations and/or reducing the negative impacts of environmental degradation.

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IMO – International Safety Manage Code

IMO – International Convention on Standards of Training, Certification and Watchkeeping for Seafarers.

On The Challenge of STCW78/10 Amendments And The Development of Seafarers' Integrated Qualifications

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Abstract

Newly revised STCW78 convention reflects the attention to the development of integrated qualifications required from the shipping industry, labor market and self development of seafarers. This article analyses the necessity of development of integrated qualifications and its influence on seafarer shortage, describes some new training requirements and contents added or incorporated in the 2010 amendments relating to integrated qualifications, analyses some challenges on developing such qualifications in China and finally gives some solutions and recommendations on implementation of the 2010 amendments and development of integrated qualifications for maritime institutes.

1. Introduction

Two conspicuous tendencies have been clear-cut on the requirements of seafarers' competence during the implementation of STCW78/95 convention. One is specialization due to the emerging special types of ships, where oil tankers, gas carriers, semi-submersibles and electric-powered ships result in the further segment of seafarer market and traditional all-purpose seafarers are seeing their position lowered. The specialists on specific types of ships are becoming popular and the shortage is more distinctive. The other is that the market is putting more requirements on the integrated qualifications of seafarers. In addition to the specialty knowledge and skills, more attention is paid to those concerning with human factor (GREY, 2009) and ship management where STCW78/95 less mentioned (Card&Spencer, 2004). Those two tendencies are the main driving forces for review and revision of STCW78/95 convention and code.

In June 2010, the International Maritime Organization (IMO) organized the discussion on the final drafts of amendments to STCW78/95 convention and code at the diplomatic conference held in Manila, the Philippines. The amendments reflect the new requirements on seafarers' competence from the shipping industry, which will render impacts on the

requirements of seafarers' integrated qualifications, and the contents and methods of maritime education and training. The maritime institutions that shoulder the education and training of new cadets are faced with new challenges.

2. Necessity of attending to the development of integrated qualifications

Sufficient amount of quality seafarers is one of necessities to quality shipping. Quality is a relative term, which includes not only competency, but also commitment, attitudes and motives. A man with good integrated qualifications could be a quality seafarer.

The term integrated qualifications refers to the composition of various aspects of specialty qualification (special knowledge and skills), cultural qualifications (human culture, safety culture, and environment protection culture), health and psychological qualifications, responsive and innovative qualifications, etc. The cultivation and development of integrated qualifications is the need of the career, of the market as well as of the self development of seafarers.

2.1 The need of career of seafaring

Safety, environmental-friendliness and efficiency are the main themes of modern shipping. Shipping is placed in a system, wider and more complicated than ever before. Shipping is no longer an ordinary job of some specific persons on a specific ship, but under the control of traffic management, supervision, and service system. Meanwhile, the relationship between man and man, man and nature, and man and machine is becoming increasing complicated.

The development of modern technology results in a more rapid renewal of maritime knowledge and skills (Yan, 2008). The large scaling and specialization of ships requires more special knowledge and competence. The informationizing and intelligentizing of ships requires a greater command of data processing and information management capability. Energy conservation and greening shipping requires greater attention to marine environment protection. These new changes put forth new requirements on seafarers' competence.

2.2 The need of competition of labor market

Follow-up investigations of graduates and feedback from Chinese shipping companies (Sun and Hu, 2007) show that the labor market has put higher requirements on integrated qualifications of the international seafarers. When selecting cadets from maritime institutions, the shipping companies are considering not only the specialty qualifications, but also other factors of morality, personality and psychology. The maritime talents in the new era need to have a good command of nautical specialty, and also familiarization of international

regulations, rules and practices, capabilities of ship management, abilities of practical competence and effective communicating in English (Wu, 2004), capabilities to suit the social environment, learning abilities of new knowledge and skills, a spirit of hard work and innovation, and a sense of safety, environment protection and sustainable development.

2.3 The need of self-development for the future

In the recent years, the cadets from the maritime vocational institutes are popular to the ship-owners home and aboard. The root reasons lie in that, in additional to the unbalance of supply and demand in labor market, an impact factor is that they are along stable path towards the sailing career, which is based on the professional tendency and the adequate acknowledgement of the self values. This is the one of the merits of vocational education.

The cadets are in an urgent need of not only command of knowledge and skills necessary to the vocational success and employment, but also of a realization of knowing and achieving of self ego and a foundation for the achievement of self values. The development of integrated qualification will effectively accelerate the formation of a vocational ideal and spirit so as to assure the stability of career orientation of the graduates.

3. New requirements on integrated qualification by the Amendments

The 2010 amendments presented some distinctive characteristics (Liu and Bao, 2010); in addition to specialty, most of them are in association with the knowledge.

3.1 More attention to development of awareness of marine environment protection

Transportation by sea is regarded as the most environmental-friendly and economic transportation mode. IMO has adopted and released more strict regulations on prevent pollution of the marine environment from the ships, most of which are ships' technical and operational related, but occurrence of oil-tank accidents and their adverse impact on the environment made the society in doubt of the safety and environmental friendliness of sea transportation. From the viewpoint of the human factors, particularly the factor of social responsibility of seafarers, the Amendments brought forth the training requirements on awareness of marine environment protection.

Training requirements on awareness of ocean environment protection are added to various sections of the revised STCW code, mainly in competence of take precautions to prevent pollution of the marine environment in Table A-VI/1-4 for all persons onboard. In competence of persons at operation level, the similar requirements are also added. These revisions clearly delivered such messages that the awareness of marine environment

protection have a status of common sense, so that they are required for all persons onboard at all levels due to their social responsibilities.

3.2 More attention to development of ability of effective communication

Efficient and effective communication is of great importance to reduce human error and construct harmonious working environment, and therefore to improve safety and efficiency. With the improvement of automation，working pressure of seafarer is more or less reduced. Persons onboard have more personal time to enjoy themselves, meanwhile the demand to communicate with internal and external persons and environment become more urgent. To reflect this demand, the 2010 amendments add competence of Contribute to effective communications on board ship in table A-Ⅵ/1-4. The added requirements are not only for the shipboard work, but also for the basic social demand of a human being.

3.3 More attention to development of ability of teamwork and management

It is proved that the training course of bridge resource management (BRM) and engine-room resource management (ERM) are of help of constructing a team, who are use all the available resources to ensure safety, security and protection of environment. To promote the development of the team work, the 2010 amendments shift the guidelines on principles applicable to BRM and ERM from Part B in 1995 code to Part A in 2010 code, which makes them mandatory. BRM and ERM are incorporated into respective competence requirements in part Ⅱ and Ⅲ for persons at operational levels, while management skills are added to these parts for persons at management levels.

3.4 More attention to the development of learning capability

With the improvement of ship automation, every seafarer's working scope extends and expands, which results in a higher level in management and techniques. With the improvement of technical and management level, the requirement of judgments based on the rules and experience lowers, while that which is based on knowledge and techniques rises. The competence of a seafarer not only lies in the knowledge and skills required by all previous amendments to STCW78 Convention, but also in the rapid adaptability to the environment and careers. Since a lot of knowledge and skills are acquired onboard, the graduates' self learning and innovation spirits should be developed through college education, so that they will increase their sense of life-long learning to suit the needs of social development. The class training, onboard training and E-learning is, in a sense, determined by the seafarers' learning capabilities.

4. The shortage of seafarers is that of the properly qualified professionals with integrated qualifications

4.1 seafarer shortage

The industry ashore and afloat is actually suffering from a shortage of competent and experienced manpower who are needed to operate sophisticated ships efficiently and safely (Grey, 2006). The research on shortage was overviewed by Leander (2010): BIMCO and ISF manpower study 2005 showed estimated shortage of officers was 2% of the market demand in that year, which will be 5.9% by 2015. Manning 2009, released by Drewry Shipping Consultants in February 2009 declared that, although shiping industry has suffered from the finance crisis, the shortfall of officers is more critical than estimated by BIMCO and ISF 2005 report, which will be 42,700, about 7% deficit by 2013. The latest research on the market demand is released by JITI and the Nippon Foundation in May 2010. The study made no prediction of a current shortage, but starts with an estimate of demand as a base to project future shortages, which will be a deficit of 7.2% for both officers and ratings emerging by the year 2020.

The latest BIMCO and ISF manpower study 2010 will be released by the end of the year, the result will not be more exceptional that officers, especially the highly qualified profesional on specific types of ships, are still in severe shortage. What is expected is whether the situation is mild , modrate or severe.

4.2 The demand of quantity will give way to that of quality in China

China has become one that owns the largest number of sailors. China presently owns 1.55m sailors, of which 653,000 are seafarers and 195,000 are officers. In addition to service the national fleet, china also exports seafarers to international market. In 2009, the seafarers exported were expected to reach up to 100,000 (counted from the seaman's book issued or endorsed, including those serviced on china-owned ships flying convenient flags. The actual number of the seafarers servicing onboard ships owned or controlled by foreign owners is 40,000-50,000). China is rapidly becoming a leading seafarer provider on the international labor market.

To satisfy the need of seafarer talents of the world shipping industry, china has established a complete set of seafaring education system. China presently owns 104 maritime education and training institutions, of which 53 institutions provide maritime education at university, college and technical school level respectively. The annual recruitment scale amounts to 460,000.

Viewing the domestic situation, the amount of the maritime graduates can satisfy the need of the self-owned fleet. But against the scale of over 400,000 graduates, the Chinese

shipping industry, still feel the shortage of seafarers, especially those for international labor market. Researches into the shipping companies reveal that, what is actually shortage are those highly qualified seafarers and those who will satisfy the need of international competition. In china, with the further growth of the number of seafarers, if the export market is still not well exploited and managed, the employment pressure on new graduates will become more apparent. Therefore, the need of amount will give way that of quality.

5. The challenges that face the development of the integrated qualifications

5.1 Amount and quality of cadet source

The maritime graduates are a main source for the officer troops. From the year 2002, with the rapid development of shipping economy and the coming of massification of higher education, the scale of maritime graduates tended towards an increasing growth. It is apparent that, in china, the source is shifting from the coastal and developed area to the Middle West and rural areas, where young people are eager to acquire maritime education and engage in the relatively laboring and hard seafaring occupation upon graduation in order to improve the economic situation of the families. They are normally stabilized, less mobile and low cost in management, and therefore welcomed by the shipping companies. This source provides a guarantee for the officer troop in number, but with a potential defects (Wei, 2008). Most of them know less of the sea, ships and seafaring except well-paid and they have a relatively weak application of English. These facts somehow hinder the development integrated qualifications and the trend tends to be more conspicuous.

5.2 Practice vessels and practice conditions

Navigation is a science as well as an art. Science can be acquired from books and teachers, while art can only be gained from experience. In the present teaching plans, there are 2-4 weeks of onboard familiarization practice and 3 months of onboard graduation practice. Familiarization practice is an indispensable period for the undergraduates to know the ship and career and to experience a seafarer's duty and responsibility. Except that some maritime institutions have their own practice ships and some big shipping companies are willing to provide cabins for onboard practice, the lack of practice ships and inadequate investment result in a fact (Li, 2009) that most maritime graduate carry out their familiarization practice either on campus simulators or on near-coastal passenger ships, or in a combined way. The effect falls behind expectations. In contrast with the national practice system as Japan, and the cooperation practice system between school and enterprise as widely practiced in Russia and the Philippines, there exists a bottleneck of availability of practice ships due to complicated organizing bodies, great number of cadets and inadequate onboard practice cabins.

5.3 The gap between national certification examination and the development of qualifications

For the college level maritime students, their campus studies last 2.5 years and while for those technical school students, their campus studies last 1.5 years. In this period, their studies center round examination and assessment for competency certification. Except for the specialty classes and skills training that are required by STCW 78/95 Convention and national regulations, English learning, quasi-military training and the lots of time spent in the preparation for the certification examination and assessment, little time is left for the development of the integrated qualifications (psychology and management, etc). The reasons for this situation lie in the fact that, most students do not attach any importance to them, because they think the subjects are irrelevant to the certificates, and that the students' time and energy are so limited that they simply do not have enough time for them. For the development of the integrated qualifications, some institutions achieve them by purposeful extracurricular activities and selective courses, while most others will not care to both.

6. Solutions and recommendations

The 2010 amendments carry their usual practice in close attention to seafarers' integrated qualifications as human factors and management in addition to the knowledge and competence in technical level, which provides mandatory basis for seafarers' education and training. The development of seafarers' integrated qualifications is not to be achieved in a short time, neither is it to be achieved by means of textbooks. It calls for campus culture, course establishment and special teaching, etc.

6.1 Renew the training contents to satisfy the minimum requirements of the Amendment

The amendment concerns many chapters, but as far as the training contents are concerned, in addition to the new mandatory training programs, such as BRM, ERM and ECDIS, other contents concerning awareness of environmental protection, communication and management shall also be incorporated into the teaching and training courses. It is necessary to timely adjust the present course structure, breakthrough the limitations of the courses and programs, renew the course contents and enforce the connection of knowledge to practice.

6.2 Merge the specialty teaching with the qualification improvement

To fill the blank of the shortage of time for qualification improvement, it is necessary to bring the concept of qualification improvement into the organization and implementation of

each of the specialty courses. In the selection of the teaching contents, in addition to the completion of the targeted contents, relevant contents concerning maritime safety, environmental protection and management can be incorporated to broaden students' knowledge. In the selection of teaching methods, attention shall be paid to the cultivation of the non-intelligence elements of students' mental power, belief and behavior, train their subjective initiative and educate their creative thinking and learning ability. In the training of specific skills, the instructors can choose the multi-lateral training mode and use the modern teaching media to enforce students' participation and cooperation. The methods can include group discussion, cooperative study and role play, etc.

6.3 Stress the use of simulators in the development of the integrated qualifications

It has been widely recognized that it is necessary to use the simulators in the training of the programs of BRM and ERM. In accordance with the 2010 amendments, these training programs are for the officers at the operational level, but some of the relevant contents should also be of assistance to be commanded as ordinary seafarers, such as communication, group work, psycho-assistance and direction techniques, etc. The instructors can include and enforce some simple theories in the training of specific skills with the help of the simulators. In simulator training, attention shall be paid to the achievement of the virtual reality to avoid the singleness of item training.

6.4 Apply the maritime campus culture

The development of the sense of safety and environmental protection are not to be achieved by hours of classroom teaching, while applying campus culture to assist could be helpful to achieve the goal. Campus culture has become a source of qualification education for developing the students' healthy psychology and personality in schools. In the construction of the maritime campus culture, prominence shall be given to "maritime culture", including safety culture and environmental protection culture. It is of special importance to those from the Middle West and rural areas.

This culture is reflected in various facets of the management and teaching activities. First of all, the management level needs to have a sense of "humanity" and give adequate attention to the awareness of safety and environmental protection in daily management. Then, suitable penalty is necessary in the process of training and practice so that the students form their own understanding that the routine operation onboard is procedualized and any breach will lead to potential risk.

7. Conclusions

Each amendment to the STCW 78 Convention reflects the requirement of the shipping industry. The 1995 version stressed the requirements on basic knowledge and skills, while the 2010 version emphasize the requirements on non-specialty elements. This is on the one hand the result of the development of technology, and on the other, the necessary requirement of seafarer-orientation and the seafaring career.

Where we call the specialty qualifications the hard qualifications, we can name those of culture, psychology, response and creation as the soft qualifications. While the education and training can improve the hard qualifications, the improvement of the soft qualifications is a long-term effort. The development of the integrated qualifications is not to be achieved merely by means of one or several training courses. In addition to the training programs as required by the 2010 amendments, maritime institutions ought to bring the concept of the qualification education into the whole process of teaching and management to accelerate the development of the integrated qualifications.

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The Impact of the Hidden Curriculum on MET

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Abstract

This paper discusses the theoretical background of ongoing research regarding the role/impact of the hidden curriculum in Maritime Education and Training (MET). It is therefore hypothetical in approach. Definitions of the hidden curriculum are examined and a discussion carried out regarding the relationships between the value students place on a study and how the hidden curriculum may be made explicit. It also hypothetically presents some skills that may augment efforts aimed at making the hidden curriculum explicit. It is expected that these discussions and the findings from the subsequent research will draw the attention of Maritime Education and Training Institutions (METI) and their lecturers, to the issue of the hidden curriculum and help them recognise, in more explicit ways, how their organisational environment, presence, delivery style and personality may "train" their students in ways they may not have envisaged.

1. Introduction

Optimum Maritime Education and Training (MET) depends mainly on:
1) Curriculum content/structure
2) Curriculum delivery and assessment methods
3) Available resources including human resources

The content/structure of the current global MET curriculum may be said to be largely dependent on the Standards of Training and Certification and Watchkeeping (STCW) Convention and the accompanying Seafarers' Training, Certification and Watchkeeping (STCW) Code, 1978 as amended. However curriculum delivery/assessment is arguably also dependent on the particular institution. This dependence is based on such factors as the

institution's philosophy, social context, and resources. The most critical of the last is the human resource for delivering and assessing the curriculum.

The human resource is often engaged and developed with competency and academic qualifications in mind. Some studies however suggest that what is transmitted in a learning environment is not only the formal curriculum indexed to the lecturer's competence and academic qualification, but importantly a "hidden curriculum" that detracts from or augments quality education.

2. The Hidden Curriculum – Definitions and approaches

The term "hidden curriculum" may first have been suggested by the sociologist Philip Jackson (1968) who argued that the educational experience of a student is much more than the sum total of what the formal curriculum offers. Students pick up approaches to living (including professional outlooks) and learning attitudes that are not explicitly stated in any formal curricula. According to Smith (1996, 2000), curriculum theory and practice can be approached in four different ways:

a. as a body of knowledge to be transmitted

b. as an attempt to achieve certain ends in students (a product)

c. as a process, and

d. as praxis i.e. the exercise or practice of a skill, art or science

In consideration of these different views and using Print's (1993, p. xvii) definition as a starting point, the term formal curriculum may be used to mean "all the planned learning opportunities, processes and experiences offered by the organisation to learners". Syllabuses will therefore be a subset of a curriculum. The totality of a curriculum together with aims and goals, subject matter (syllabuses), instructional methods, assessment and evaluation of end products of skill and/or knowledge would define the educational experience.

Importantly the total educational experience also includes aspects that are not explicit and may be latent. The hidden curriculum, after Print, is used to mean "those learnings unintentionally passed on to students during the presentation of the intended curriculum … not intended by curriculum developers and … not stated as objectives in curricula" (Print 1993, p. xix). Print further cites a definition from Seddon as follows:

The hidden curriculum refers to the outcomes of education and/or the processes leading to those outcomes, which are not explicitly intended by educators. These outcomes are generally not explicitly intended because they are not stated by teachers in their oral or written

lists of objectives nor are they included in educational statements of intent such as syllabuses, school policy documents or curriculum projects (Seddon 1983, pp. 1-2 as cited by Print 1993, p. 10).

Similarly, Smith cites Kelly in defining the hidden curriculum as "those things which students learn, because of the way in which the work of the school is planned and organized but which are not in themselves overtly included in the planning or even in the consciousness of those responsible for the school arrangements" (Kelly 1988, p. 8 as cited by Smith 1996, 2000). It includes the norms, values and belief systems that students learn from the social context of the educational institution, both in the lecture hall and in the organisation as a whole. The hidden curriculum can be argued to be a constant and dynamic phenomenon which may be largely imperceptible to both receiver(s) and transmitter(s).

Currently, global MET is contending with aspects of training that are not always easy to include – as an assessable outcome – in a formal curriculum. Such desired outcomes revolve around issues that include professionalism (in behaviour and attitude), assertiveness versus tolerance of hierarchy, integrity, gender neutrality, environmental consciousness and the balance between business competition and cooperation among others.

3. The hidden curriculum and value of course of study

In a slight departure from the previous definitions given for hidden curriculum, Bergenhenegouwen (1987) sees the term as describing the whole of informal and implicit demands of study and study achievements that are to be met for someone to complete units of study as opposed to the formal and explicit demands. This definition places an emphasis on study achievements and perceived demands. In other words, not only is the student focused (consciously or unconsciously) on the demands and expectations of the formal curriculum, he/she is also motivated by the implicit demands, expectations, style or focus of the individual lecturers. In this regard Bergenhenegouwen (1987, pp. 538-539) differentiates between the exchange value and practical value of a course of study.

The exchange value of study refers to the students' perception of what they can use a final educational qualification (as a product) to gain. In other words, the University qualification is viewed as a marketable commodity or product that can be exchanged for another product – a job, with the associated salary and perks. The more the qualification in question is deemed to be scarce and valuable, the more its exchange value is perceived to be high.

On the other hand the practical value of a study refers to how the students perceive the study content to be relevant to practice, their own future need for the solving of real (industrial) problems and questions either in their own experience or in the experience of others that they deem relevant to them.

Figure 1 shows succinctly the discussion above.

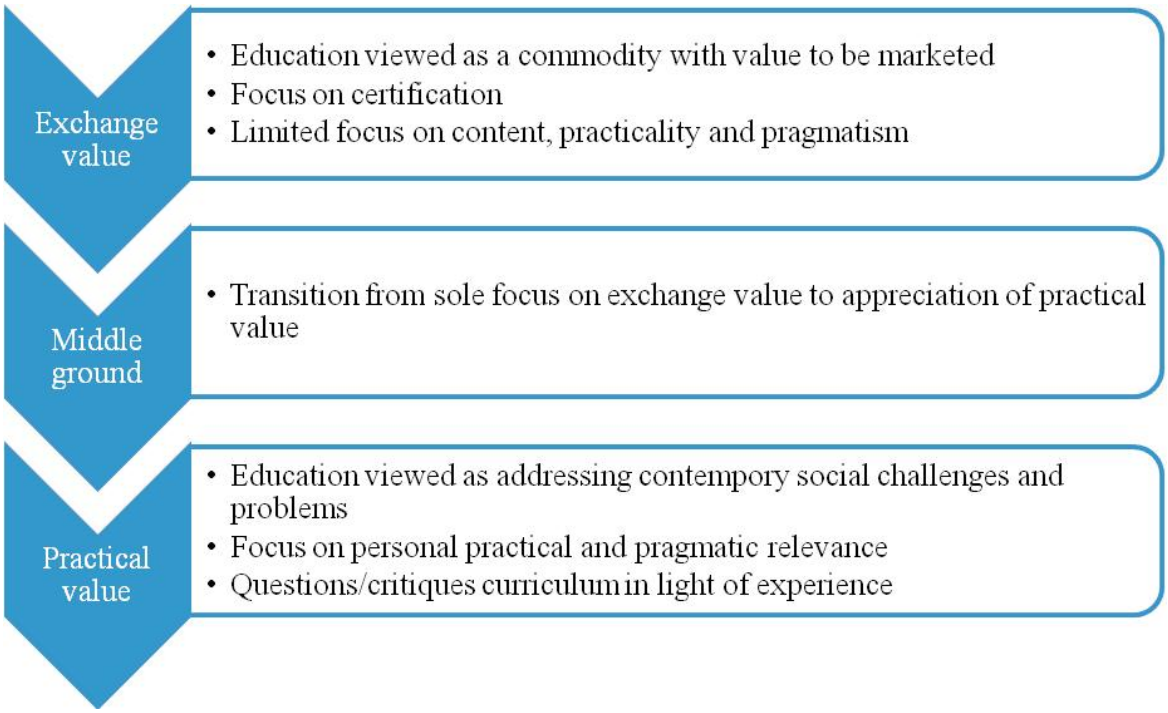

Figure 1. Exchange value to practical value

Where the exchange value of a study is high for the student, he/she is not motivated to critique the hidden curriculum. For such a student, the hidden curriculum, especially that associated with summative assessment, becomes highly important because the focus is on addressing the total demands/requirements of the learning environment (whether formal or latent) in order to "pass", get the "commodity" needed i.e. certification and be in a position to market this. The focus is on gaining the academic qualification irrespective of the content of the formal or hidden curriculum.

However, this is not the case where the practical value is considered more important. The student then seeks to critically examine the content and relevance of all curricula – formal or hidden. This allows for more in-depth analysis of what may otherwise be cursorily treated.

Ironically therefore, where there perhaps the greatest dependence on and impact of the hidden curriculum, the context is such that it is not queried. Attempts made to make it overt – on the part of students – are limited.

Deriving from the analysis above, Bergenhenegouwen (1987, p. 540) describes a number of student attitudes that can be influenced – for better or worse – by the hidden curriculum. These attitudes form the bases on which the student reacts or responds to the hidden curriculum. Two extremes of such attitudes are:

a. The formal curriculum-oriented attitude

Where students are oriented in this manner, they neither perceive a distinction between the exchange value and the practical value of a programme of study nor exhibit any substantial discriminatory behaviour in this regard. The curriculum-oriented attitude is often

due to a lack of exposure to the reality/practical aspects of the programme as a whole and can be said to be more associated with early under-graduate students or with students engaged in an introductory phase of a study. Their focus is as yet limited to the requirements of the institution and their behaviour, attitudes and focus are deemed legitimate once they are perceived to be compatible with the institution's norms and expectations. Whether these norms and expectations are transmitted by the formal or hidden curriculum, they are not analysed and not questioned as to whether they are legitimate parts of an optimum curricula related to reality.

b. The practice-oriented or experience-integrating study attitude

Students with this orientation perceive a difference between the study's exchange value and practical value. Such students are more discerning and discriminatory of the role of the curricula – formal and hidden – in addressing not only theoretical questions but in solving real life practical questions/problems/challenges in their own sphere of experience or in the experience of others that they deem relevant to them. They thus show a preference for the practical value of a study as opposed to its exchange value, seeking to integrate the theoretical educational experience with practical experience.

Experiential learning plays an important role in this. Such learning may be seen as occurring when the processes of learning are triggered by events that lie directly in the learner's contexts. It is internally generated learning that is derived from the learner's own experiences and the consequences of those experiences to the learner (Manuel 2009, p. 79).

Of course there are many attitudes that lie between these two potential extremes. These two are however particularly relevant to MET delivery given the evolution of the structure of curriculum delivery and the apparent transition from a solely competency-based approach to a more generic (perhaps liberal or scientific) University education.

4. Relations of curriculum exchange value/practical value with sea time

The evolving practice in global MET appears to be that young adults study for 3-4 years on degree programmes that precede a prolonged career at sea. During the ensuing sea career and at different times, they sit for competency exams so as to be upgraded in competence certification. In some instances some sea experience is incorporated into the degree programme, but this is limited and at a sub-operational level (cadetship). The training approach where potential ship officers are trained in a "sandwich" manner is fast disappearing. This latter approach was made up of significant sea-time interspersed with prolonged times of studying in a theoretical context.

It can be argued that when young adults enter an institution of higher learning, they tend to respond to the curriculum in a "bookish" or "schoolish" way. This response tendency is more associated with prioritising the exchange value of the course of study over the practical

value. One notices an obvious tendency for early undergraduate students to focus on how to get through the particular phase of education with the specific goal of gaining a University qualification. This emphasis is seen to be reduced or balanced when one observes students preparing for competency-based exams and who have had experience in the onboard context.

If these observations and arguments are real and plausible, they suggest that seafaring experience is correlated with a more critical consideration of the formal curriculum and in the University context queries more what is rightly labelled the hidden curriculum emanating from a particular lecturer. As has been discussed and as put by Bergenhenegouwen (1987, p. 542) where there is such experience "the study motivation is mainly to gain an insight into the connection and interrelationship between theoretical study units and practical problems". Such experienced students are more liable to read into the hidden curriculum and to question both its content and relevance. They do so by juxtaposing such curriculum with their practical experience and end up demanding the explication of criteria and evaluation/assessment requirements. In this way they expose hidden parts of the curriculum. On that premise, students behave, not as empty buckets to be filled, but as candles whose fanned flames are burning brightly. A formal feedback mechanism that re-interprets any surfaced "hidden curriculum" is then important. Such re-interpreted notions can be assessed for their inclusion in the formal curriculum.

What this implies is that the current pervasive practice of complete delivery of a theoretical education prior to the taking of competence exams without reference to more classroom exposure is limited in its ability to sufficiently address an experience-integrating growth process of the student.

5. Generic skills for making the hidden curriculum overt

If the importance of the hidden curriculum (together with its value derived from the student's attitude and orientation) is acknowledged, then it is just as important for Maritime Education and Training Institutions (METI) to examine in what ways such curricula can be made overt and explicit. When this is done, positive aspects of the hidden curriculum can be assimilated into the formal curriculum and negative aspects acted on to expunge them from the educational system. In the process of making the hidden curriculum explicit, awareness must be the primary prerequisite. METI as organisations – and individual lecturers associated with them - must be (made) aware of the potential impact of the hidden curriculum and the role they may play in either positively or adversely influencing students. Following awareness, a number of generic skills are deemed appropriate and helpful. They include:

a. Negotiating of reality

"Negotiating reality" is a term coined by Berthoin Antal and Friedman (2005, p. 77) to name a "strategy for effectively engaging societal interactions and generating a richer

repertoire of action strategies". They further indicate that it "involves surfacing the tacit knowledge and assumptions of the parties involved and bringing this knowledge to bear in the service of addressing a particular issue or problematic situation" and allows individuals to "become aware of how the contours of their own "cultural iceberg" shape their perceptions, expectations and behaviour as complex cultural beings". The term was therefore originally applied to multicultural interaction. However it obviously can apply to the surfacing of components of the hidden curriculum. This also involves surfacing the tacit knowledge and assumptions of the parties involved in societal interaction and bringing this knowledge to bear in the service of addressing a particular issue or problematic situation, which is the subject matter of a curriculum.

In negotiating reality with regard to the hidden curriculum, individuals must be made aware of how the contours of their own assumptions, history, values and norms shape their perceptions, expectations and behaviour as complex cultural beings. In that context it can also be applied as a means of engaging with others (students and industry in this case) to explore what they value as educational outcomes beyond the formal curriculum.

Negotiating reality as applied to the hidden curriculum can be dynamic and made to yield explicit curriculum items that are context-specific.

b. Appreciation of the wider context of learning

There is a tendency for lecturers to focus on the often narrow ends of assessments tied in to the formal curriculum. An appreciable skill for making overt the hidden curriculum is to appreciate the attitudinal and behavioural competencies that are valued in the industry – the wider educational context. This must necessarily be an ongoing and dynamic process.

c. Consciousness and optimisation of modelling roles

To some extent, the impact of the hidden curriculum is related to role-modelling. With regard to latent learning, it is perhaps in this area that lecturers have the most influence on students. The emphases lecturers place on various parts of the curriculum (by what is said and what is not said), how lecturers speak, their facial expressions, appearance, life-styles etc. all go a long way to affect students' perceptions of lecturers' modelling roles.

6. Student skills that make the hidden curriculum overt

The hidden curriculum is often treated as something that "happens" to students. However students themselves are active participants in the socialisation processes and contexts they are involved in. Far from being passive receptacles, they "negotiate, accommodate, reject and often divert socialisation agendas" (Kentli 2009 p. 86). Accordingly, the process of making the hidden curriculum explicit can be augmented by a number of specific student skills. These include:

- Critical thinking skills

- Independent problem articulation, analysis and solving skills. Problem articulation is used here to mean exploring interrelationships between issues.
- Assertiveness in discourse (not at odds with respect and politeness)

7. Conclusion

The hidden curriculum is an important aspect of education and training that is often neither appreciated nor examined in MET. It is important that institutions providing such education and training become aware of the existence of the phenomenon, and additionally actively try to make explicit the hidden curriculum. It must be a goal of METI to make their lecturers aware of the hidden curriculum and to assist in developing in them the skills necessary to make it explicit. Similarly METI must aim at developing such skills in students through the formal curriculum. Skills so developed will serve both students and lecturers in good stead beyond curriculum delivery, receipt and assessment. It is also suggested that detailed "student exit interviews/surveys" that seek to measure the construct of the "hidden curriculum" will also be helpful in the determination of how pervasive or impacting this latent educational experience has been in any student experience.

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The next Decade China's Higher Maritime Vocational Education Developing Trend

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Abstract

Since 2000, the number, system, quality factors of China's higher maritime vocational education are analyzed, analyzes the existing problems. Development based on the shipping forecast on China's higher maritime vocational education in the next decade, the development trend of China's higher maritime education in-depth exploration. Ideas put forward to achieve changes in maritime education; institutions control the layout and scale of development, environment, and maritime training institutions should be required to adapt to modern vessels to explore the content of vocational education development in maritime construction.

Keywords: higher maritime vocational education; developing trends; the next decade; China

1. Maritime Vocational Education has been developed rapidly since 2000

Into the 21st century, China's educational management system continued to deepen. In the Ministry of Transport, "insisted the industry guidance, and promote vocational education and transportation industry in close connection with" strategy under the guidance of experienced transportation institutions transferred to local or subordinate enterprises reform. Compared with 10 years ago, the campus area of traffic vocational schools was growth of 3.8 times, constructions area increased by 3.3 times, the number of student in school was increased in 3.8 times, faculty and staff increased by 2.2 times, 2.5 times growth in experimental and training facilities, growth in gross fixed assets 7.7 fold.

1.1 Number of student to develop have been expanding

As of the end of 2008, the author of statistics 18 navigation majors offered by vocational colleges. Classified by the main specialty, the institution can be divided into three categories. The first category is based on maritime, sea, the seafarer named institutions, a total of seven, accounting for 39% of the total. Maritime specialty is the subject of such institutions, such as Shanghai Maritime Academy, Qingdao Ocean Shipping Mariners College, Wuhan Marine

College, Zhejiang International Maritime College, Guangzhou Maritime College, Jiangsu Maritime Institute, Nantong Shipping College, etc.

The second is vocational and technical education or any other name of the independent set of vocational colleges (such as the Xiamen Ocean Vocational College) and so on. These institutions a total of nine, who account for 50% of the total, in organizing maritime specialty, while land transport-related specialty development focus of such institutions.

The third category is the university faculties, the statistics for the two, accounting for 11% of the total number of such institutions in organizing maritime undergraduate education, but also enrolled some of the maritime vocational students.

Statistics show that 18 institutions of maritime specialty in the number of students more than 20000 (Statistics on higher maritime vocational education in China accounted for proportion of 90%), accounting for maritime students at all levels over 60% of the total. From 2003 to 2005 for three years, the average annual growth of 32.7% admission scheme, in which year the fastest growing nearly 53%. 2006, 2007 and 2008, the actual enrollment was higher than the average of the previous three years. In 2009, "Seafarer Training Management Rules" was issued by the Ministry of Transport, and further tightened the requirements of school. However, student numbers of the higher maritime vocational education are retaining its position as various educational levels did not change the status of the head.

1.2 School System and Training Model

"School system" determines the real "money come from, where people go" issue. A stable funding source and a clear direction of the employer, the institution was no great problem of the development.

After "Tenth Five-Year Plan" and "Eleventh Five-Year Plan" in reform, maritime vocational educational institutions system matures. According to a more representative survey of 18 institutions in data analysis, in which 13 institutions in the educational management system placed under the provincial education department director, to accept Provincial Communications Department (or the Forestry and Fisheries Office) operational guidance; 3 institutions by the Central directly under the charge of major shipping companies, to accept provinces (municipalities) Department of Education operational guidance; 2 institutions where the University College of subordination.

Planned economies that rely entirely on the school funding situation of the organizers no longer exist. 18 institutions, the education funding of them were come from different channels, most institutions can share the result of reform, reflecting the institutional rationalization.

Table 1. The main source of school funding and the corresponding number of institution

Source of funding	educational funds	tuition fee	grant-in-aid for education	training revenue	special funds	social donation
Institutions (Number)	15	18	4	18	18	unknown

Higher maritime vocational education and training mode is diversity, the institution keeps development of "combination of industrial enterprises" and "School and Enterprise Integration", etc. The mode of education and training is including "Order form", "Agreement Type", "Sino-foreign cooperative," "campus in the simulation of the production ship," "shipping enterprise to do teaching point" and so on. The institution with mode of "School and Enterprise Integration" are mainly under shipping companies, such as Qingdao Ocean Shipping Mariners College is organized by the China Ocean Shipping Group, , Shanghai Maritime Academy is under the China Shipping Group, Wuhan Marine College is under the Wuhan Changjiang Shipping Group. Other institutions also conduct in-depth ranging from "Work and Enterprise" maritime education and practice.

1.3 General improvement in the quality of education

Over the years, vocational education, one-sided advocacy of employment-oriented, seems to have a job after graduation, graduates of institution have a higher employment rate, and higher vocational education will be recognized that is successful. So, how to deal with interviews, how to win to "keep the love at first sight" became the focus of important content. Affected by winds, maritime vocational institutions are also to some extent deviation. The certificate of competency examination by the seafarer as the golden key to universal, the time of public course has been occupied; the student cannot improve attainment, the quality of education affected.

Practice shows that in addition to shipping companies in the post graduates have certain requirements for skills in addition, their overall quality of attainment and the same has expected. Because, in addition to the ship and technical personnel with the operation of individual skill to play a role in the post, at same time, they were also managers, business managers need to use personal charm to influence the long-term living with the seafarer.

"Eleventh Five-Year Plan" has been widely recognized maritime institutions of higher scale of development at the same time should pay more attention to quality. The college has carried out dual-qualified teaching staff, curriculum and teaching materials and a focus on maritime training facilities building. Only the "Eleventh Five-Year Plan" has been updated on the main course teaching materials up to 22, with 13 as the Ministry of Education, "Eleventh Five-Year Plan" teaching materials. Emphasis on professional expertise in maritime culture, while actively promoting the once-neglected maritime vocational social

skills, professional way navigation capabilities, comprehensive quality educational activities, and achieved very good results.

Qualities of higher maritime vocational education have generally improved reflected in the shipping companies' satisfaction for the "product". According to a research report, the satisfaction of shipping companies for graduates from higher maritime vocational education is 87%; only 0.7 percentage points lower than the undergraduates, 29 percent higher than the level of middle vocational education, indicating that graduates from higher maritime vocational education institutions were widely recognized by shipping companies. Result of the global financial turmoil, the international demand for a staged adjustment maritime shipping firms to hire a number of maritime course students also declined. The author analyzes the end of 2009, graduates of five higher maritime vocational education institutions; a total of 1273 graduates in employment to 1201, the employment rate were 94.3%. Even in 2009, this grim economic situation, employment rate of graduates was no major fluctuations, indicating the quality of higher maritime vocational education emphasis on education, to cultivate the practice of practical talents are the social and corporate identity.

2. Problems in Development of Higher Maritime Vocational Education

2.1 Educational concepts in a continuous need to deepen

The educational concepts are in the soul of the school, higher maritime vocational colleges as well. In China, all kinds of qualifications of higher vocational education is the shortest in history, no more experience for higher vocational education colleges group can be used for reference.

"Tenth Five-Year Plan" and "Eleventh Five-Year Plan" period, China's higher maritime vocational education infrastructure projects met the extraordinary development. With the rise of high-rise developing, a wonderful article "Educational Concepts" was created at the same time. After a brief search download a lot of fine-tuning to form the slogan is not improper in itself, but "Educational Concepts" is a school of education and culture, is rich in content. At present, the widespread lack of higher maritime vocational education "Educational Concepts" meaning in depth.

"People-oriented, focusing on the development", "improve quality, regulate innovation", "education services, giving the fishing", and so catchy entry different stages, different regions have different education, the profound meaning of the object. Therefore, the lack of profound and higher maritime vocational education should pay more attention to construction of campus culture, combined with social and economic development situation and when a running into the grasp of the direction of the school, looking to deepen the "Educational Concepts", and gradually accumulated higher navigation unique cultural heritage institutions.

Meanwhile, in the past decade, of all institutes, there are still deviations development concepts, in the idea for running school, lay too much stress on student numbers, belittle quality of student; in education and training concept, more focus on examination, look down on quality; in the training concept, pay more attention on theory, light skills. Under the seafarer passed certificate of competency examination by the Maritime Safety Administration was became the goal oriented education system; it is difficult to cultivate high-quality seafarer for developing modern ship needs and that lead to the structure of seafarer team is irrational in China.

2.2 Urgent target model refinement

China's transport systems higher maritime vocational education in the model needs to establish a benchmark of school to study and innovates other institutions. Advanced educational concepts, clear of traffic characteristics, the leading comprehensive level, and among the top educational reform and specialties development are the principles for determining the traffic model institutions.

Model developing to promote respect for the institutions essential meaning of the reality of individual development, can show large scale of innovative institutions, also should be small but focus on content development and establish a benchmark institution.

Found to be out of the demonstration as a "selection of advanced," the cycle. Even if an institution is not the strongest in many aspects, but as long as the home base of a similar size to the forefront of institutions, on the same scale construction and development institutions should be identified with a model for the demonstration of its institutions. Therefore, various factors must be integrated under the premise of model refinement as soon as possible indicators of higher maritime vocational education.

2.3 Content development to return to an important position

Specialized subject development and curriculum construction is always the daily work of vocational multitude core work. "Tenth Five-Year Plan" and "Eleventh Five-Year Plan" period, the number of institutions devoted fully engaged in the hardware construction, infrastructure construction of the school's central task overwhelming, specialized subject and curriculum development and other educational content to be marginalized. Years of accumulation, leading to lean teachers, training courses can not normally out, and even teaching programs and often can not be implemented due to change. Some institutions navigation course student number of navigational instruments from the "seafarers' training rules," the gap continues to widen.

Teaching staffs' development is the basis for specialized subject and curriculum development. Teacher education administration departments in line with national norms and

requirements of maritime institutions must comply with the guidelines, where a qualified seafarers training institutions, both in terms of quality system manual based on the school to be clarified. Control the Ministry of Education "Teaching Assessment" targets; teacher and student ratio has just reached the average pass rate. "Dual-qualified teachers" requirements from the Ministry of Education, there are still 4 percentage point difference. Therefore, according to requirements of "Teaching the work of assessment index" and "seafarers training rules", development of content of higher maritime vocational education institutions, including maritime teaching team, quality course construction, textbooks and maritime training management system construction etc. is urgent.

2.4 Vocational education continue to narrow the gap between developed shipping country

China's higher maritime vocational education compared with the world's developed shipping countries, whether in educational concepts, the education management system, knowledge is updated and so considerable gap exists. Teachers in general lack of international perspective, teachers with little experience of international counterparts. The past decade, although the state has invested higher maritime vocational education in a significant increase of funding, but running low efficiency, the use of the structure of education funding uncertain and unreasonable. Many issues restrict the content of development of maritime vocational education. To strive to narrow the gap between the developed shipping countries, the first renew the maritime educational concepts and deepen educational reform. The second mechanisms in the management of the appropriate reference the experiences of other countries, so too retreat to a strong administrative intervention, the Committee of Experts to Head of Department or to play a greater role.

3. The development trend of higher maritime vocational education exploration

Higher maritime vocational education in the next decade will be to achieve navigation of educational concepts; institutions to control the layout and scale of development; maritime training institutions to adapt to modern shipping environment required; navigation content development of vocational education developing.

3.1 Achieve navigation of educational concepts

If the task of maritime education in the past decade the scale of development is to adapt to the rapid development of China shipping fleets needs, then the task of the next decade based on the quality of maritime education to adapt to the development of large ships and

modernization of China's special development needs of the ship, that is, in order to cultivate a high-quality seafarer for navigation of educational concepts.

The task of education is to make a perfect personality, then the maritime education is for the future seafarer's perfect personality; because of today's maritime education will be for the maritime industry of tomorrow; Maritime education is the foundation of high-quality seafarer. Therefore, the maritime college's mission is to train students to become common good basic quality of the future seafarer, embodied in a good occupational spirit, professional quality, vocational skills, obtain access to the vocational qualification certificate. Only with the basic quality of seafarer members, after the ship's temper practice and training and work, be possible to become a real high-quality seafarer. Given the above discussion, maritime vocational education program focuses on the seafarer of occupational spirit, professional quality, vocational skills training, and allocation of teachers, teaching part, theoretical teaching, practical training, student management, professional qualifications and other aspects to cultivate good basic quality of the future seafarer.

3.2 The scale of institutions coordination with shipping developing

Although due to global financial turmoil, the international shipping demands a staged adjustment. But the global shipping capacity will not change long-term growth trend, if in 2010 the global economy and trade in a full recovery, the global shipping capacity by 2020 may reach 12.8 billion tons more than forecast (see table 2).

Experts according to China's domestic economy and shipping industry trends, combined with 《China's Eleventh Five-Year National Economic and Social Development Plan》and 《highway and waterway transport" Eleventh Five-Year "development plan》of China's merchant fleet in 2020 and the number of seafarer of the total demand is predicted, will be more than tonnage of ships owned 1000DWT will reach 4786, senior officers and crew of more than 310000 in total demand (see table 3).

Table 2. 2011-2020 world shipping demand forecast

Year	predictive value (million tons)	Year	predictive value (million tons)
2011	8978	2016	10953
2013	9721	2018	11859
2015	10526	2020	12841

Table 3. 2010-2020 seafarer Demand Forecasting in China (high-manning)

Year	Senior seafarer (person)	Ratings (person)	Total (person)

2010	81537	112010	193547
2013	95589	131473	227063
2016	115472	153282	268755
2019	129125	171345	300471
2020	133943	177703	311646

Over the next decade, to add the number of new seafarer members will be needed in China (see table 4).

Table 4. 2010-2020 added in China needs a new seafarer every year the amount (high-manning, seafarer assignment steady growth)

Year	Senior seafarer (person)	Ratings (person)	Total (person)
2010	4755	6484	11238
2013	5420	7380	12799
2016	6453	8424	14877
2019	7093	9233	16326
2020	7324	9524	16848

The task of Navigation undergraduate education is to cultivate higher shipping management personnel; the task of higher maritime vocational education is to train professional seafarers. Thus, in 2020, maritime university graduates in control of 10000 each year, undergraduate and higher vocational student ratio of 3 by 7, which undergraduates after 2 years and 50% engaged in maritime work. Together with other uncertain factors, then higher maritime vocational education institutions annual delivery 8000-9000 graduates are more appropriate scale, thus the number of student in higher maritime vocational institutions is 24000-27000.

3.3 Structures a practice training environment to fit with technological progress

Experts predict that the next decade, computer technology, satellite communications, and materials science will be rapid development, and is widely used in ship construction. Benefit from the technology, ship's bridge, engine room and deck equipment, new technology will significantly speed up the pace. Intelligent navigation system, data ship's bridge, engine room automation power control systems, and computer and sensor technology based on the cargo control systems and other new technology widely used in new ships.

The next ten years, the total campus area of higher maritime vocational education in the current basis (including the approval of a building) grow another 20%. Construction of experimental training to compensate for the previous period the lack of input to higher maritime vocational education in 2020 for practice training places, total area of the need to

build on the current growth of 100% and equipment worth at least 5 times the current. The next decade, large shipping companies, especially large shipping to participate in the construction of higher maritime vocational education total investment may reach 5-6 times over the past decade. In the form of special funds, funded by the provincial local government institutions to promote higher maritime facilities or public open Seafarer's Training Center, will achieve full coverage.

To achieve the higher maritime vocational training "from the navigation and seamanship skills-based operation to upgrade talent, from the operation of the use of traditional navigation techniques using advanced technology to the operation of the ship modernization of the ship's personnel changes, the transport production from the closed to the open to international shipping competition talent development "progressive leaps and bounds, erected with the technological progress in the training platform is the foundation to achieve the objective. From now on, then ten years, higher maritime vocational education in China will certainly be able to achieve from the current campus building the world's leading maritime training to the world-class.

3.4 Promote the content of institutions suited to vocational education developing

Party and the state have attached great importance to vocational education. Since 2000, the State Council has convened three National Vocational Education Conferences, all made the decision on the decision to develop vocational education, vocational education specifically to economic and social development and education an important foundation for the strategic focus, "to the service for the purpose employment-oriented" policy of vocational education in schools, for everyone, the whole of society to promote reform and development of vocational education in China has made significant progress, achieving a historic breakthrough. Vocational education development policy environment, public opinion and social environment has been significantly improved.

Higher maritime vocational education has characteristics of higher education, vocational education and job training at same time. 1989, UNESCO adopted the 《Convention on Technical and Vocational Education》, developed the world's technical and vocational education development guidelines and policies, which have important maritime vocational education guide. STCW78/95 Convention for the training of seafarers around the world to set a uniform international standards, the implementation of the Convention, States Parties on the promotion of vocational education in improving the quality of navigation, reduce human impact on sea accident played a positive role.

The next decade, China's higher maritime vocational education focuses on content development and the critical period. By 2020, the higher maritime vocational education in the environment will be further improved. In the people's congresses, governments, enterprises, institutions and the community efforts of the parties, the work should be

completed nautical legislation. The government will establish marine education law, which parallel with "Vocational Education Law" and "Higher Education Act", for the development of maritime education to provide basic legal protection.

The development of education in the maritime environment of the premise of improved, content of higher maritime vocational education developing will be a breakthrough in several aspects:

1) Higher maritime vocational education and training to achieve normalization of working assessment, networking, target more scientific and rational, social and employers strengthened the supervisory role of the institutions;

2) Credit management higher maritime vocational education popularized the level of economic development credit to achieve considerable regional institutions exchange. Maritime vocational education university is established, graduates achieve the desired goal of quality;

3) specialties and curriculum development in close connection with the production practice of shipping, engineering, integration, school-enterprise cooperation (or the school and enterprise integration) mode cover all institutions (failed unit is out), the application of production technology in institutions for the current update cycle shortened to half;

4) Higher maritime vocational education and training Mode become more scientific, practical seafarer career "theory of teaching, maritime practice, theory teaching 'sandwich'" training mode institutions more than 50% coverage. Training courses to improve the implementation of the fundamental conditions;

5) Higher maritime vocational education in full compliance of teachers, "Seafarer Training Management Rules", teachers participated in the inter-school exchange and international exchange opportunities to increase and broaden the international perspective;

6) ment procedures, training plan for the implementation of the institutions and seafarer competency exam to get a certificate of good coordination, theory test and practical assessment in the form of great convenience to the examination seafarer;

7) Role of higher maritime vocational education demonstration enhancement achieved by the present model exemplary professional institutions to change, a group of professional personnel training and the outstanding achievements of the Marine Technology Marine Engineering Management demonstration effect can be ever bright;

8) Maritime authorities issued a timely manner consistent with ISO9001: 2000; quality management system requirements for "quality of education and training of seafarer management rules," the new rules in the international arena to enjoy the same creditworthiness DNV. Rules used by the higher maritime vocational education institutions to implement scientific, efficient, standardized and orderly management, education and training to seafarer members to a new higher level.

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Social Impacts on the Maritime Education–A Case Study of National Kaohsiung Marine University in Taiwan

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Abstract

Taiwan's commercial fleets reach 26.3 million dead weight tonnages in 2007 and are constantly supported by the human resources incubated by the maritime educational institutions in Taiwan. Recent developments in Taiwan toward the technology intensive country, the employment of cost effective foreign labors by shipping companies, the widespread of universities and the internationalization of shipping industries propose considerable threats on the quality assurance of maritime education. A resultant crisis for lacking on-board seafarers with managerial levels has urged the consolidation of governmental, private and educational organizations in the attempts to further improve the quality of maritime education and to promote the on-board career incentives. The process from the formulation of problems to the implementation of strategies undertaken by the National Kaohsiung Marine University (NKMU) is reviewed. A chain reaction initiated from the degradation of students' entry performances due to the widespread of universities has formed a viscous cycle leading to the outsourcing of foreign human resources by shipping industry. Strategies in the aspects of course reform, joint ventures of lectureship with shipping industry, pre-courses for students' extended career plans and the establishment of educational center that consolidates the departments of navigation, marine engineering and fishery in NKMU are illustrated. This case study is served as a portfolio for transitional developments of maritime education in a country that undergoes furious educational reforms with strong dependencies on the ocean transportation for economic activities.

Keywords: NKMU, Maritime education

1. Introduction

Taiwan is an island of 36,000 km^2 with 70% of mountain area. The 23 million populations are squeezed in the 30% of landscape. Economic developments in Taiwan heavily

rely on the importing and exporting trades via marine transportations. Port cargo throughputs in Taiwan steadily increase from 20 million tonnages in 1971 to 281.2 million tonnages in 2009 [1]. Since year 2000, Taiwan's commercial fleets have rated as the world top 11 countries that continue to expand and reach 26.3 million tonnages in 2007. Along with the growth of commercial fleets, the percentage of Taiwan fleets with national flag is steadily reduced as a combined effect of China's economic bloom and the cross-strait policy implemented by Taiwan government. Taiwan government prohibits direct trades between Taiwan and China. Cargos transporting between Taiwan and China are required to be transferred through the third party such as Hong Kong or Macao special administrative region. As a result, a considerable amount of Taiwan fleets is changed into Flag of Convenience (FOC) vessels that occupy about 84.9% of entire commercial fleets in 2007 [2]. The ship owners with national flag, mostly for those controlled by governmental shareholders, are forced to urge government to amend its policy on recruiting the foreign on-board crews in order to re-gain their competitive niches. Since 1994, Taiwan government allowed the foreign labors to work on the ships with national flag. After only one year, the percentages of on-board foreign seafarers rapidly grew to 26.8% and 73.2% for the managerial and operational levels respectively [3]. As a result, the number of Taiwanese seafarers has considerably reduced from 30,000 in 1970 to about 4,458 in 2010 although Taiwan's commercial fleets are constantly expanded. These current developing trends of increasing FOC vessels and recruiting cost effective foreign labors also observed from other developed countries which certainly affect the sea-going career opportunities for the graduates from maritime educational institutes.

Another trend of development that affects the maritime education system in Taiwan is the overwhelming increase of universities at the occasion experiencing considerable reductions in birth rates. Taiwan government has implemented a 10-year educational reform that amends the educational policies to large extends. In the respect of higher education, the introduction of free-market mechanism and the promotion of establishing private universities have affected the operation of maritime education system. The number of universities and institutes of technology is increased from 58 in 1994 to 145 in 2004. The increasing rate of undergraduate students from universities and technical institutes is 296% (from 35.6 millions undergraduate students in 1994 to 105.5 millions undergraduate students in 2004) over the last decade. While the number of university in Taiwan is expanding, the birth rate is annually reduced. The decreasing rate of birth is about 15,000 persons per year since 2003. At year 2015, all the universities and institutes of technology will face the annual decrease of students entering the university. The dramatic increase of undergraduate students as a result of university expansion indirectly imposed negative impacts on recruiting students into maritime educational institutes in Taiwan. Furthermore, several vocational high schools ceased their departments specialized in navigation and marine engineering. These vocational high schools, which are the major sources of students for the maritime technical university, establish new

departments with general interests to meet the demands of the newly established universities. The shortage of students available for the departments of navigation and marine engineering not only degrades the quality of students entering these maritime institutes, but the efforts required for the maritime institutes to educate these students in order to comply with the Standard Training, Certificate and Watchkeeping for seafarers (STCW Convention) are increased. With the shortage of educational funds as a result of university expansion and the degradation of student entry quality, a chain reaction that leads to the shortage of qualified seafarers for shipping industries in Taiwan is stimulated. In resonant with the increased FOC vessels and the increase of foreign seafarers, the maritime education system in Taiwan has suffered twofold threats in the respects of providing quality graduates and promoting incentives for sea-going practices. A series of educational plans are accordingly formulated and implemented by the maritime educational institutes in order to resolve these difficulties. The social impacts on maritime education system in Taiwan within the last decade and the strategies formulated by NKMU are described.

2. Social impact factors toward maritime educations

Operations of maritime education system from the recruitment of students to the career development of graduates are closely interacted with the social developments. In the last decade, several social events that impact the development of maritime education systems in Taiwan are inter-correlated to form a viscous cycle which provides considerable threads on incubating qualified seafarers. These social events include the nationwide Educational Reform, the Cross-Strait Trading Policies implemented by Taiwan government, the compliance with STCW Convention and the Internationalization of major Shipping Companies. A net result of these inter-correlative social events causes the considerable shortages of qualified seafarers for Taiwan's shipping companies. Impacts of these social factors on Taiwan's maritime education system are illustrated as follows.

2.1 Educational reform

The 10-year educational reform in Taiwan is treated as an important policy with the attempt to improve the qualities of educational systems from primary schools to postgraduate institutes. Table 1 summarizes the major events planned by the Educational Reform Committee in the central government and implemented by the Ministry of Education (MOE) that provide considerable influences on the future developments of the higher education systems in Taiwan.

Table 1. Major events of educational reform in Taiwan (1994-2004)

Period	Major events in relevance with the higher education system
1994-1996	**January, 1994.** Amendments of University Law that introduce the democratic systems into each university with the attempts to fulfill the so called Governance by Professors. This has led to the direct elections of President, Deans and Head of departments by the votes from the in-campus teaching staffs. **August, 1994.** Pass the Teacher Law that emphasizes the independence and proficiency of each individual teaching staff in each educational institute.
1996-1997	**December, 1996.** Educational Reform Committee in the central government submits the detailed plan for educational reform. This plan is designated to be implemented by the Ministry of Education. Expansions of higher education institutes are initiated.
1997-1998	Acting plan for educational reform is approved with NT$ 157 billions (US$1≒NT$32.5) invested.
2004~	Accreditations of universities.

The program of educational reform encouraged the establishment of private universities. The concept of free market mechanism for competitions between universities with more flexibility in setting the tuition fee and the gradual decrease of government subsides for the national universities are the main focuses for the higher education system. In particular, the implant of democratic systems into the decision making levels for each university and the voting systems for electing the President of university, Dean of faculty and Head of department by teaching staffs in each university have dramatically changed the managerial styles in each university. This is implemented by setting the University Law. One of the most decisive influences through this educational reform program that affects the development of maritime education is the widespread of universities within the last decade. Fig.1 depicts the entry rate of university during the period of educational reform.

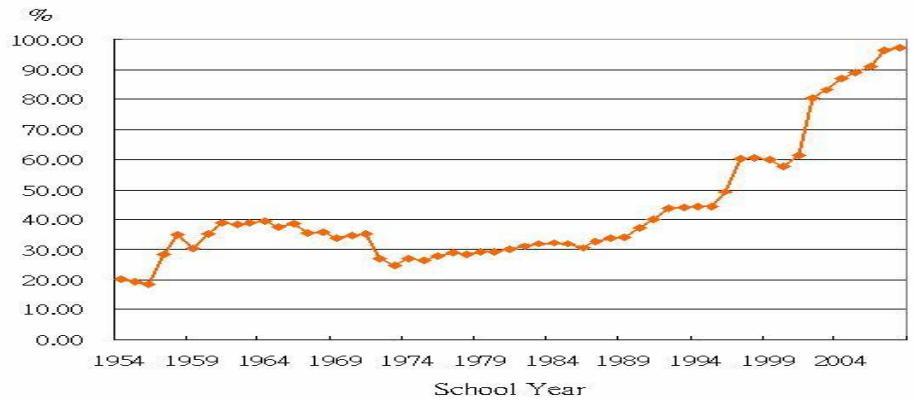

Fig 1. Entry rate of university in Taiwan during the period of educational reform

At year 2004 as indicated in Fig.1, the entry rate of university hits 87.05% which still keeps increasing until 97.14% in 2009. But the averaged dropping rates from the universities in year 2000 are less than 2%. The expansion of universities with fancy graduation rates

affects the vocational education to large extends. More high school students devote themselves to the university track without considerations of entering the vocational education system. This development trend certainly squeezes the domain of maritime sectors in the higher educational market. Furthermore, this trend motivated several vocational maritime high schools to close the departments of navigation and marine engineering due to the difficulties in recruiting students and arranging funds for sea-going practices. In this respect, five vocational maritime high schools closed the department of navigation and three vocational maritime high schools ceased the department of marine engineering. In year 2005, only 274 and 208 vocational high school students graduated from the departments of marine engineering and navigation respectively. This shortage of vocational high school students incurred considerable influences on the quality of students entering the vocational maritime university such as NKMU. As an illustrative example, the students needed by the departments of navigation and marine engineering of the maritime universities for the two-year vocational program leading to bachelor degree are more than the students applied for these two departments in 2006. This problem, however, has been foreseen by the maritime universities. The departments of navigation and marine engineering of these maritime universities have started to recruit students from the mechanical sectors since 2004 in the vocational domain. As indicated in Fig.2, the entry rates from the maritime and mechanical sectors are respectively kept at about 40% and 20% respectively.

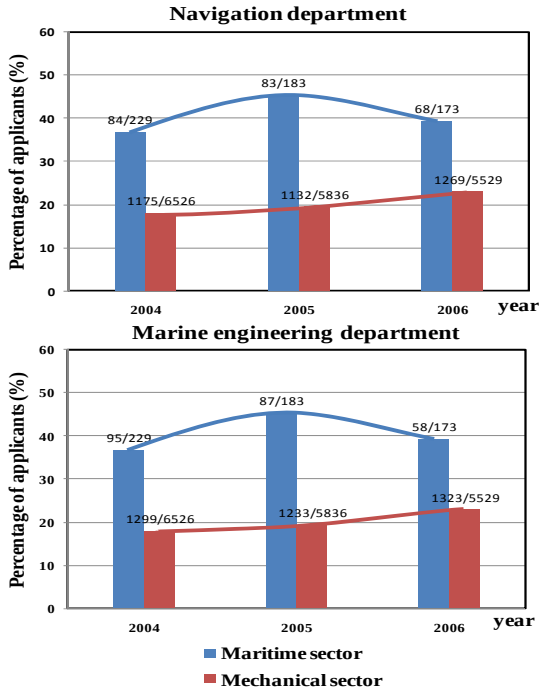

Fig 2. Entry rates of students into departments of navigation and marine engineering for maritime universities

It is interesting to note that, although the education reform emphasizes the free competition, but there are still two systems, namely the general higher education and

vocational education systems, which recruit their students from the senior high school and the vocational high school respectively. This condition is seen as the unfair competition by the universities in the vocational system but ensures the opportunities of higher education for the graduates from vocational high schools. A recent trend indicates a considerable market-shift toward the senior high schools as a considerable amount of vocational high schools is changed into general high schools. Nevertheless, although the policy of diverting student sources in the vocational sector is critical for quality assurance of maritime university, but the negative impacts on the developments of vocational maritime high schools are inevitable. A recent educational program linking the vocational high school, university and shipping company is formulated to solve this problem, which will be described in the later section.

2.2 Cross-strait trading policy

Taiwan's maritime universities keep very strong links with the shipping companies. Not only the career developments of students in the fields of navigation and marine engineering are majored in these companies, but these shipping companies are the solely supplies for sea-going practices as no training vessel for maritime universities are currently available. As a result, the increase of FOC vessels, which implies the less opportunity for the ships to port in Taiwan harbors, directly impacts the arrangements of sea-going practices for maritime universities.

China's economic bloom is indicated by the increased exporting and importing trades from 102.79 (1988) to 1,760.69 (2006) billions US$. The increased shipping markets in China have attracted the worldwide attentions. However, justified by the political considerations, Taiwan government prohibits the direct importing and exporting trades across Taiwan Strait. As a result, the number of FOC and foreign flag vessels owned by Taiwan's shipping companies is steadily increased since 1997 as indicated in Fig.3. The direct impact of increased FOC and foreign flag vessels is the considerable shrinkage of opportunities for sea-going practices. As an illustrative example, only about 40% of students in the departments of navigation and marine engineering in NKMU are allowed to fulfill their sea-going practices in 2006. Furthermore, due to the large increase of cost effective foreign labors in the FOC and foreign flag vessels, the on-board learning environment is modified. English proficiency becomes more important for the cadets as English language is often used for their daily communications. The establishment of friendly learning environment for the cadets in order to stimulate cadets' incentives for on-board career developments is now a complex issue for each captain in the FOC or foreign flag vessel. The on-board training courses for each maritime university in Taiwan are forced to be amended from the compulsory to optional courses since 2003. In comply with such modification, the course modules in the departments of navigation and marine engineering are accordingly modified to large extends.

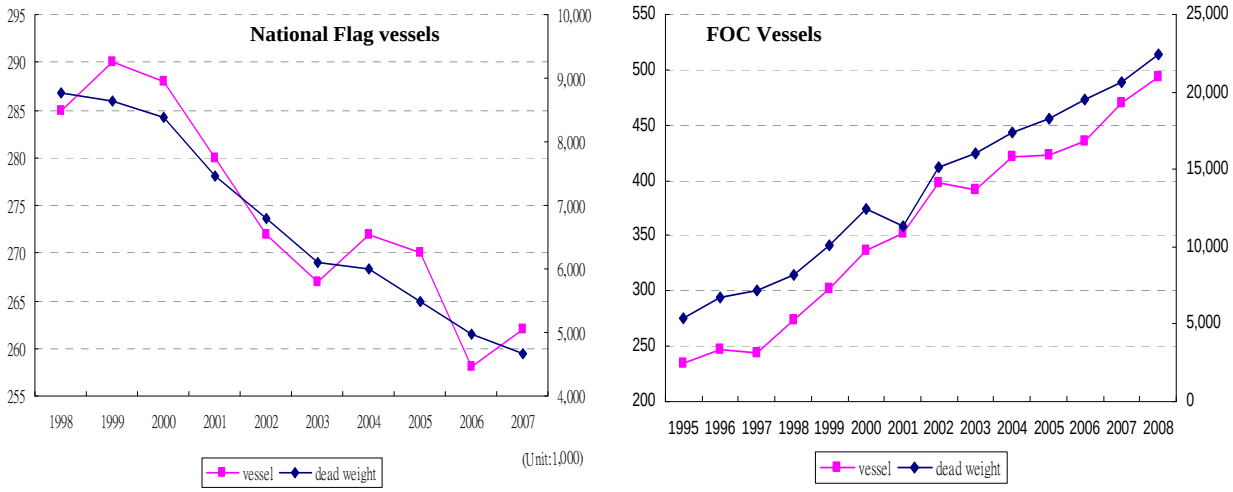

Fig 3. Increases of Taiwan shipping tonnages and vessels' number of FOC vessels and National Flag vessels

2.3 STCW Convention

As an endeavourer of IMO to further improve the safety of ships and their equipments, the 1995 STCW amendments raised the standards for seafarers. These amendments were entered into force since 1 January 1996. Within these amendments, all detailed technical requirements are transferred to an associated Code with the required skills and competence to be clarified. These required skills and competences were reviewed along with the educational programs in NKMU. Adjustments of course modules to comply with 1995 STCW amendments were undertaken in NKMU since 2000. In particular, the use of simulators for training and assessment purposes has been recognized in 1995 STCW amendments. A large amount of governmental funds were invested to set the simulation centers in the maritime universities for training and educational purposes. In this respect, the impacts of 1995 STCW amendments on Taiwan's maritime education and training were positive. However, as 1995 STCW amendments require the administrations to maintain direct control over and endorse the qualifications of those masters, officers and radio personnel they authorize to serve on their ships, the systems of education, training and certification for seafarers in Taiwan were revised since 1995.

In Taiwan, the professional licenses of masters, officers, marine engineers and radio personnel are issued by the Ministry of Transportation and Communication (MOTC). Before 2004, all the examinations for the certifications of masters, officers and marine engineers were controlled by the Ministry of Examination (MOE). Candidates for this type of national examination have to hold the graduation certificates from the associated maritime departments. Having completed the required sea-going and working experiences, the successful candidates through these maritime professional examinations will be qualified to accept the professional licenses issued by MOTC. However, in order to fulfill the 1995 STCW amendments, MOE revised all the examination questions in comply with the codes. The format of test questions was converted into the type of choice question. Only the certifications of deck officer and marine engineer with operational levels are required to pass the national examination held by MOE after 2003. As the standards for the seafarers are raised in 1995 STCW amendments and the quality of students entering the maritime universities keeps degrading, the annually averaged pass rate for the seafarer tests in 2004 hits the historically lowest level of only

6.19%. But the number of candidates entering these examinations in 2007 also breaks the highest record of about 2,040 persons as indicated in Fig.4.

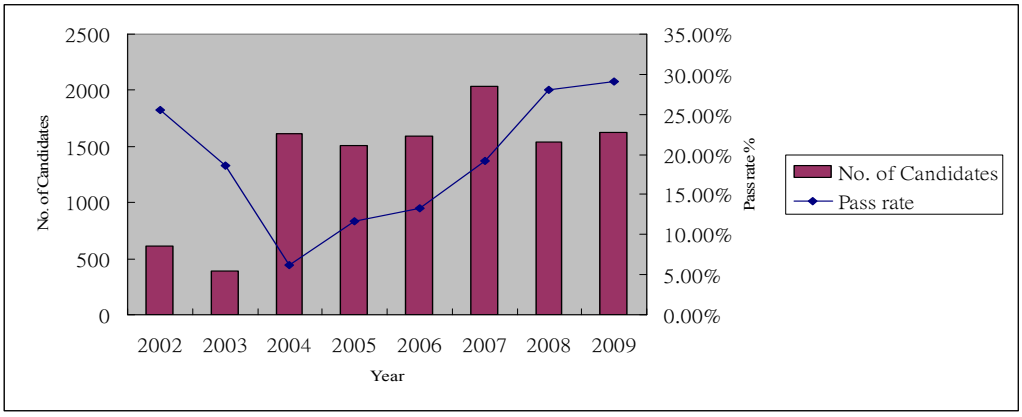

Fig 4. Number of participated candidates and pass rates of national examinations for professional marine engineers and deck officers

After year 2004, the pass rate increases steadily that reaches 28.40% in 2008 as seen in Fig.4. The number of candidates considerably increases from those years before 2003 to the numbers about 1,600 after 2004 as depicted in Fig.4. In the period of years 2000-2009, Taiwan experienced the economical recession. The increased number of candidates for seafarer tests is partially attributed to the attractive on-board payments during the economical recession. Nevertheless, the increased candidates for seafarer examinations also reflect the endeavourers undertaken by the maritime education system that promote the incentives of students to develop their sea-going careers. In the respect of low pass rate, several aspects are wroth of study in addition to the degrading quality of students entering maritime universities.

The timing of considerable reduction in the pass rate of seafarer examinations coincides with the blooming of shipping industry triggered by the dramatic economic boom in China during the period of 1994-2009. The severe shortages of seafarers during this particular period hit Taiwan's shipping companies and result in several counter measures undertaken by these shipping companies which have made the educational problems worse. The formation of interactive chains triggered by the lack of seafarers and the 10-year education reform generates a viscous cycle that requires more efforts from the maritime universities in order to resolve the shortage of seafarers and to assure the quality of seafarers. Fig.5 summarizes the important social factors and their impacts on the maritime universities.

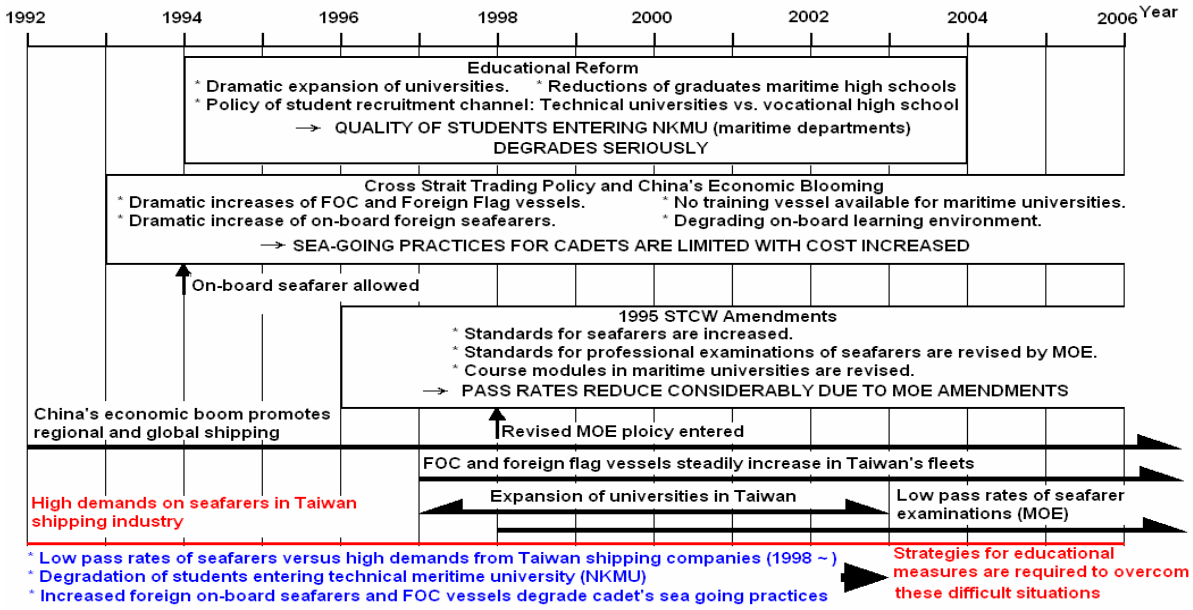

Fig 5. Major social factors and their impacts on maritime universities (1992-2006)

The low pass rates of professional seafarers along with the increased demands from Taiwan's commercial fleets exert considerable pressures on NKMU. It is worth noting that most of the problems summarized in Fig.5 can not be completely solved by NKMU alone. Under such difficult circumstances, NKMU has to formulate a series of counter measures in order to assure the quality of graduates from the departments of navigation and marine engineering. Moreover, with the enhanced competitive advantages for Taiwan's shipping companies, the pace of internationalization of shipping industry in Taiwan is accelerated. The aim at recruiting quality seafarers rather than the cost-effective seafarers is gradually adopted by the major shipping companies in Taiwan. As the pace of internationalization of Taiwan shipping industry is accelerated and the considerable decrease of birth rate that will hit Taiwan's universities on 2015, the number of FOC and foreign flag vessels is expected to be increased and the degradation of quality of students entering NKMU seems inevitable. If the number and quality of seafarers can not meet the future requirements of Taiwan's shipping industry, the process of internationalization at each major shipping company will result in the increased numbers of on-board foreign seafarers that worsen the current salutations experienced by NKMU. The inert-correlating scenarios initiated from the degradation of students' entry performances to the outsourcing of foreign human resources by shipping industry may become more severe if the adequate measures are not implemented at the correct times.

3. Strategies for quality assurance undertaken by NKMU

NKMU has undertaken a series of measures to counter balance the impacts caused by the social events on the maritime education system as depicted in Fig.5. Two main focuses of these measures during the period of 2001-2009 are the quality assurance of graduates from the maritime departments and the promotion of incentives for sea-going career developments. Strategies to overcome the problems of student recruitments due to the reduction of birth rate, which will be in effect on 2015, are not addressed in this report. The on-going series of countermeasures implemented by NKMU in the period of 2001-2009 are summarized as follows.

- **Quality assurance of teaching and training programs**

Quality assurances of educational programs for the departments of navigation and marine engineering are the subjects of prime importance that initiate all the countermeasures undertaken by NKMU during the period of 2002-2009. The course reforms with the adequate treatments of sea-going practices and the appropriate adjustments of course modules in order to comply with the STCW Convention, as amended, were performed. Qualities of educational and training programs established in the departments of navigation and marine engineering are now under constant reviews by Det Norske Veritas (DNV) classification since 2002. This initiative is fulfilled by entering the International Organization for Standardization (ISO) system certified by DNV classification. Due to the shortage of opportunities for sea-going practices, the compulsory sea-going course of 45 days is changed into the optional course and the period of sea-going practice is extended from 45 days to 6 months or one year. In the revised educational program, only about 40% of students those express their strong incentives of sea-going career developments will be accepted for the 6-month or 1-year on board training program. The remainders of students will entry the engineering or management courses to develop their second expertise during the 6-month or 1-year period. This amendment in the respect of on board training program was immediately accepted by the shipping industry as the feedbacks from the investments on each cadet became more effective. The center of simulators is also established in the Seafarer Training Center of NKMU at this stage. Seafarer Training Center in NKMU coordinates the training and teaching programs that involve the use of simulator. As the Seafarer Training Center is a self funded department in NKMU, the financial burdens of operating and maintaining these simulators are released from the university funds. Government funds for building the training vessel suitable for incubating seafarers with operational level are under constant pursuits by NKMU since 2001 in order to further ensure and improve the quality of on board training programs.

- **Lecture series conducted by major shipping companies**

Lecture series organized and delivered by major shipping companies launched the departments of navigation and marine engineering since 2003. This series of industrial lectures provide opportunities of mutual communications between the managers from shipping companies and students. Future career developments for the students in the maritime departments are directly demonstrated by the industrial lecturers on the bases of mutual discussions. Employment contracts can be offered and signed during this lecture series. Weaknesses of students' performances can soon be identifies and responded to the associated departments by the lecturers from shipping companies for further improvement.

Another aspect expressed in these lecture series is the long term career plan and opportunities for the students with sea-going career plans. A multidiscipline course module which consolidates the courses form the departments of navigation, marine engineering and shipping management is formulated. This program is designed for the students with the long term career goal in the shipping industry after several years of sea-going experiences. The basic knowledge in the respects of navigation science, marine engineering and shipping management will be beneficial for the officers of managerial levels in the shipping companies. Once again, this multidiscipline course module is widely accepted by Taiwan's shipping industry.

- **Establishment of educational center for navigation, marine engineering and fishery**

The educational center for navigation, marine engineering and fishery was established in 2005 as an official center in NKMU. This center was approved by the Ministry of Education

(MOE) with the attempt to formulate and implement the adequate measures on the annual basis to assure the quality of educational programs in these departments. Funds for operating this center are granted by MOE. During the recent two years, the text books of 17 subjects in the fields of navigation and marine engineering were published that included all the required knowledge for the operational level and partially the managerial level summarized in 1995 STCW Convention. The improvement of English proficiency for the students in the departments of navigation, marine engineering and fishery along with the review of accreditation system that was currently undertaken by MOE for maritime departments are the short-term objectives to be accomplished. Future plans to link the educational systems from the vocational high school to NKMU are formulated in order to extend the quality assurance policy from the university to vocational high school. The plan to edit and publish all the required text books for the departments of navigation and marine engineering of maritime vocational high schools is under revision by MOE. Similar to the lecture series conducted by shipping companies in NKMU, the NKMU lecture series implanted in the course modules of vocational high school are currently considered with the attempt to secure and cultivate the students in the vocational maritime high schools.

It is worth noting that the educational program that consolidates NKMU, China Steel Shipping Company (CSSC) and the maritime vocational high school is currently testified in the department of marine engineering of NKMU. Fifteen students in the maritime vocational high school were selected to enter this educational program with the courses monitored by the department of marine engineering of NKMU. Upon the graduation from the maritime vocational high school, these students can directly enter the degree courses in the department of marine engineering. In NKMU, the sandwich courses with one year in campus and the subsequent year on board are arranged with the assistances from CSSC. Having completed two cycles of the campus and sea-going programs, these students are offered with bachelor degrees. Obligations for these students are two years of career developments in CSSC as the marine engineers after passing the MOE professional tests. However, justified by the MOE pass rates of these students entering this type of educational program, the promotion of such program to navigation department and other maritime vocational high schools will be considered.

4. Conclusions

Recent impacts of several major events on maritime educational system in Taiwan are illustrated and analyzed. The interactive chains triggered by the lack of seafarers and the 10-year education reform in Taiwan trigger a viscous cycle that degrades the quality of students entering the maritime university and leads to the outsourcing of foreign seafarers by Taiwan's shipping companies. Several counter measures implemented by NKMU in the attempts for quality assurances of students in the departments of navigation and marine engineering are described. This NKMU case study is served as a reference for the current development of maritime education system in the countries that experience considerable expansion of universities with intention to promote the pace of internationalization of their shipping industries.

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Curriculum Vitae

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Modern Technologies can Improve the Learning Experience in Maritime Management

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Abstract

In this paper, we are going to evaluate the impact of new technology on improving the learning experience in Maritime Management. The first part of this paper is designated to consider the role of modern technology on maritime management. Second section is delegated to analyse the various aspects of training such as: On line educational services or distance learning, Storyboard training method (film or movie as training purpose), CAL(Computer Assisted Learning) Program, MUD(Memorising, Understanding, Doing) training technique, MORAL (Method, Objectives, Resources, Assessment, Learners) training method and also the CBT (Computer Based Training) method of learning exercises.

The next segment of the paper is devoted to describe the MARCON project which is about the Improvement of Maritime Lecturers Competencies based on STCW95 Convention. Furthermore, the familiarization of the lecturers with the advanced training equipment and modern technologies will be considered in depth. The last part of this paper is dedicated to describe the significance of simulator training exercises in a full mission bridge simulator or more than the IMO requirements in order to improve the learning experience by presenting real images to the trainees. It should be noted that the creation of different scenarios by the instructor will be described profoundly with the degree of realistic and the validation in visual presentation of simulator training.

1. The role of modern technology on maritime management

Based on STCW95 Convention, it is compulsory that all maritime colleges to be equipped with the latest navigational aids, such as Radar, AIS, ECDIS, GMDSS, Simulators, etc. as training equipment in order to enhance learning experience. As Dr.Alston Kennerley expressed that "...traditional chalk and talk teaching methods will no doubt form part of the package, they are increasingly peripheral to the provision of central and individual learning resources". Therefore, the quality of training has been improved by using the availability of modern technology such as overhead Computerise systems, projectors, audio, video, multimedia devices, Visualizer, Computer Based Training and so on. Navigation and Bridge Team Management (BTM) courses are of great advantage with changing times and practical parts that require to be updated to cover the use of integrated bridge systems, such as ECDIS, GMDSS and AIS, etc. Indeed, the principles of management are more or less similar nevertheless the team works quite differ with extra responsibilities. For instance, advanced fire fighting course based on STCW95 Convention can be done in order to increase the team skill of seafarers. Professor, Captain Gunter Zade (1997) stated that ...the key provision for the successful use of media is the qualifications of the teacher and his/her familiarity with the potential and use of the technology... It means that the effectiveness of Maritime Education and Training can be improved by having experienced and qualified lecturers who are quite familiar with the modern technologies. As international requirement for mariners to be trained

in bridge team and resource management, by referring to human factors only is called bridge resources; it means that when covering all bridge resources (humans, bridge facilities and appliances, navigational means, etc) then we can say that bridge team applied. It should be noted that Dr.Alston Kennerley (1997) expressed that …the provision of learning resources starts with planning the way student learning will be managed. It means that Maritime Education and Training should be based on the contents of the revised STCW95 Convention for ship officers' education and training. Based on STCW95 Convention, it is compulsory that all maritime colleges should be equipped with navigation, radar, ECDIS, GMDSS, Simulators, Seamanship laboratory, English and Computer classes. As Cap.R.Syms (1997) stated that 'Simulation, in whatever form it might be, sophisticated or otherwise, is simply a teaching tool no different than say an overhead projector or a video machine.

Using computer programs for testing English qualification of the cadets is popular but it is not a standard method, because some of them are weak for oral examination of Certificate of Competency. The approval of English as the main language at sea is caused to gain texts in English, and majority of maritime courses are now taught in English in order to develop fluency in this language. It is possible to read the International Journals such as Seaways through the specific web site in order to increase their knowledge and professional information.

2. An analysis of new methodology in Maritime Education and Training

Training methods can be classified as Classroom instruction, Audiovisual training, Computer Based Training, On the job training, Simulation training, Action learning, Team training, Case study, and Behaviour modeling; noverthless, some of the above mentioned are quite useful in order to be carried out at Maritime Universities. One of the new methods of training is Computer Assisted Learning (CAL) program which is a method of offering an advanced program of ship trials by using computerise systems. This type of professional training may consist of the combination of audio, video, text, photographs and animation for each lecture in order to improve maritime education and training. In fact, the other name for this methodology which is the combination of the above mentioned is called multimedia system to be used by computer. As consequence of many research in this regard, it caused to create motivation of human senses in order to improve learning styles and skill of navigators by using the media.

Another new methodology in maritime education and training is the storyboard training method which is the written arrangement of the proposed production which may be compared to that formed for a film or movie as training purpose. The storyboard editor or training developer and the person who is responsible for producing the computerised version or multimedia author are not usually one or same person and these two persons generally converse. Dr.Cap.Michael Vanstone (1997) stated that a very basic storyboard model of training could be as follows:

a). The training should commence with an introduction to the content of the program. It should state clearly what benefits the individual will gain by completing the program and what the ultimate objectives of the training are.

b). It should outline what the user should be expected to do and/or know on its successful completion.

c). The information should be presented in gradual stages, either with stand alone text i.e a combination of text, graphics, illustrations, photos, video and audio.

d). The selected graphics should be interesting, memorable and avoid the inclusion of unnecessary information or background. Audio playback sequences should be specific, with appropriate emphasis.

e). Individuals can be asked during the process to 'interact' (partake in an extra activity by placing the mouse pointer and 'clicking' or use a keyboard entry to activate a 'hot spot' or small section of the displayed screen). This, for example, will reveal other information, graphics and/or pictures allowing further exploration and discovery within the program.
f). The process should also support overall memory building, decision and action planning and allow periods of reflection on the supplied materials.

According to the above mentioned factors the storyboard method should contain all of the related information about the particular subject and the proposed style of presentation should allow the trainee to progress and understand the program easily. There are different training programs in existence of the storyboard training process which are related to the specified software used. Availability of the computer aided learning methodology is a core advantage for the trainees to learn the professional subjects at any time they are interested in. Nowadays, majority of classes of Maritime Universities are equipped with the process and installing computer terminals and basic computer assisted technology in order to improve the quality of training.

In other words, the elements of learning can be classifies as MUD (Memorising, Understanding, Doing); therefore cadets should learn the most parts of their training by using the MUD method which is as three following steps: 1.Memorise some facts, e.g. name different parts of a computer 2.Understand ideas, e.g. how the computer work 3.Do an activity to learn from experience, e.g. install software and service the computer yourself. The cadets even can follow the other similar and more effective maritime training method such as Learning, Memorising and Understanding. In this regard Marton, Dall'Aba & Tse (1996) expressed that "memorising what is understood, and understanding through memorisation". The first part is much easier to memorise what is already understood. Nevertheless, Hess and Azuma (1991) found when studying Japanese students that memorising is a useful precondition for understanding. It means that both memorising and understanding are mutually increasing learning experience.

Another training method is MORAL which is stand for as Method, Objectives, Resources, Assessment, and Learners. The aims of this educational framework is to provide the confidence and skills necessary for the students and training staff in order to use the technology to support their learning and teaching activities. In this method of training a series of questions are provided and will be repeated for further modification until the answers are reliable with each other.

3. Distance learning is used to improve learning experience

The distance learning program is provided in a regular training method in order to improve the skill and quality of persons at sea; and also, the advantage of distance learning is because of the professional short courses and higher education. As the USA embarked in World War II, military planners and trainers realized how difficult it would be to prepare the millions of service men required around the world to ensure consistency and thoroughness in training (Rosenberg 2001). The solution came in the form of the army training film. These films covered everything from personal sanitation to weapons maintenance. It should be noted that PLATO (Programmed Logic for Automated Teaching Operations) was developed at the University of Illinois in the early 1960s. some decades before the World Wide Web was known, "the PLATO system pioneered online forums and message boards, email, chat rooms, instant messaging, remote screen sharing, and multiplayer games, leading to the emergence of what was perhaps the world's first online community" (Woolley 1994). Since the late 1990s, many of the issues with CBT are being addressed through the rise of web-based learning. The term 'e–learning' was first used publicly by Jay Cross of the Internet Time Group in 1998.

The aim of on-line educational services is to provide methodical and regular training on board ship in order improve the skill and quality of a person at sea. Nowadays, majority of merchant ships are equipped with computerized systems which are linked from vessels to all over the world and vice-versa through Internet and satellite technique. The system is also used as an effective tool for monitoring the requirements of the IMO, its regulations and recommendations. As result of using the advanced technology and due to the new training requirements (IMO model Courses) in the STCW95 Convention, the instructor should be a qualified lecture. An assessor can be an experienced Captain with a full knowledge of the advanced technologies and electronic tools. Therefore, he/she would be able to evaluate the skill and ability of trainees in line with his/her professional knowledge and experiences based on the requirement of the STCW95 Convention. It should be noted that the simulator training and assessment can be carried out as a special course for qualified seafarers. This course is carried out by an experienced Master mariner with a good intellectual capacity in computerized tools who is eager to be an instructor or assessor of the simulator training course. P.Chugani (1997) attempts to draw our attention to a very common education and training; 'in a traditional process of education, teacher and students are under the same roof at the same time. The aim of a distance learning program is to facilitate and provide systematic training on board towards appropriate competence for the required position of an individual at sea. The instructions and guidance pave the way for the structured development of an individual. Such a program on board assists newcomers as well as their senior to carry out desired activities, It seems that if MET-institutions want to use web based distant learning (e-learning) in the maritime studies in the future they will have to improve the competencies of the maritime lecturers as only few lecturers are using the method now and only one of every five lecturer think he/she has good competencies to manage e-learning; and is added advantage for improving the learning experience.

4. CBT is used to improve the learning experience

Computer Based Training is the integration of video and sound into a package of standard computers in order to improve the learning experience of the students. This type of interactive simulator software is used for more familiarization of trainees with constructions and operations of systems and to provide situations for trainee's reactions of the emergency conditions. In the former article about CBT of Cap.R.Rayner (2000), we found that 'for many students, particularly those in developing countries, which supply many of today's seafarer, learning from computers has a positive impact on their self-esteem and self-confidence'. Competition in the presenting pictures of simulator is the way of machines work for visualizing complex systems which can exhibit powerful experiments to assist in learning. The CBT offers an effectual, and in some emergency cases is the only safe training method. The learner is presented with facts as text, video and audio, graphics, animations or a combination of those items, and then tested on what they have been shown. Indeed, the CBT packages in comparison with the traditional method chalk and talk, and even some advanced training modes are useful methods for improving learning experience through open learning in a large community. During the 1960s, it was believed that television could deliver all kinds of learning in the classroom while also reaching to all corners of the planet (Rosenberg 2001). But because it was very expensive to produce television learning content and because we did not know how to make instructional television programs that were fun to watch. Television was not teaching but a one-way provider of information: it lacked the ability to interact with the student, to provide feedback and to make changes on the fly to respond to students' needs (Rosenberg 2001). The shortfalls of television led to the rise of Computer-Based Training

(CBT) in the 1980s. But CBT has some major shortcomings as Rosenberg (2001) described below:

• New technical issues such as incompatibility between the software and hardware and slow system performance;

• Many of the CBT programs were basically electronic page-turners and as such were not stimulating; and,

• Rapidly changing knowledge base meant that, as CBT programs were released, some of their content was already obsolete; the long production cycles and the fact that the content was "burned" on CD meant that it was difficult to provide updates and changes.

For many individuals the first contact with Computer Based Training (CBT), probably would have been the 'tutorial' programs supplied with new software. Indeed, CBT development requires collaboration between the shipping specialists, the training provider and the computer programmers.

5. Simulator is used to improve the learning experience

It is interesting to note that research by Cap.R.Rayner, (2002) concluded that there is enough evidence to support the claim that simulator training is good at improving the efficiency of the learning experience. The significance of maritime training by using simulator technique has been highlighted in order to increase the skill of seafarers on board ships. In the former article, Michael Pollitt, (1990) stated that "attention is now being focused on giving practical training that meets new operational requirements". It means that due to his opinion, maritime management should be focused on practical parts in order to update operational activities. The best method for practical training is to use ship simulator. According to the investigation of Prof.Hiroaki Kobayashi, (2000) the following comparison had been made for optimum learning: it was recognized that the total ability acquired by simulator-used training is almost equivalent to it acquired by on board training (learning experience). In fact, as result of the design of new ports or modification in operation of the existing ports; it is more economy to train Master of new coastal crafts by using simulator technique. As Dr.I.R.McCallum (1981) stated that it is important to train also in techniques to cope with failures, both of the ship equipment and of the shore based facilities. Nowadays, as result of the technological improvement in computerize systems; the above mentioned conditions can be assessed by using fast time and real time simulation model on a Personal Computer (PC). It is recommended that at least 10 manoeuvres per condition should be down by trainees. Of course, number of runs per condition has not been specified by IMO through the IMO model courses number 1.22 for ship simulator and bridge teamwork and number 2.07 for engine room simulator. As far as the quality of bridge and engine room resource management is concerned, section B of chapter eight of STCW95 Convention and ISM instruction approved by IMO for Masters and deck Officers in this regards. Simulator training course is to implement the mathematical model of the type of vessel or craft and the manoeuvring environment. The performance of the trainees (Cadets, Officers, Pilots, and Masters) as variable item can be considered for the next simulator training course. It is necessary to give very useful information during the execution of the simulator programme with reference to the manoeuvring strategies, operational factors, etc. In simulation technique, transfer refers to the degree to which learning of the simulated situation is caused to perform the same case in the real situation easier. Professor, Captain Gunter Zade (1997) stated that ...Simulators help reduce the training job gap and facilitate the transfer of training to shipboard reality... Therefore, the degree of reality is an effective factor of transfer in simulator training.

It should be noted that some training on board ship are difficult to be performed, for instance fire fighting training without motivation of smoke and flame seems to be unrealistic,

therefore the degree of fidelity and validation in visual presentation of simulator training should be taken into account.

6. The MARCON Project and Qualification of Maritime lecturers

The MARCON is stand for as Improvement of Maritime Lecturers Competencies project which is based on policies to underpin the European maritime universities system into worldwide framework. In 2001, this project is started when the e-learning initiative came to light at Europe; therefore the computerised technology became an important item for educational system. According to the technological improvement in shipping and due to the required revision of STCW Convention for changing of the levels of training; these requirements need maritime lecturers trained and familiarised with new equipment and technology in order to train the others. Studying the professional subjects in English language is not easy for non-English speakers, so the brainy candidates should be selected through an appropriate examination. Based on STCW95 Convention, the potential of maritime lecturers for teaching the subjects in English language should be outstanding. Moreover, as the English language is compulsory for mariners to communicate with the other nations on board ships, therefore a team of English lecturers with high quality in writing and speaking English should be provided at maritime universities. Mette Hundahl (2007) understood that most of the respondents are of the opinion that maritime educational institutions could improve their lecturers in the first place by refreshing their practical expertise. Another important way of improvement is by means of further education, conferences and courses. Even though this statement is very clear, it is not really clear in which field more education etc. is recommended. They must be quite familiar with the latest technological improvement and computerised system in training methods. The lecturers should follow the IMO model courses in order to understand the content of each subject which must be followed. There is a clear tendency towards those respondents who have teaching experience or research experience consider it more important for maritime lecturers to have postgraduate studies and to participate in research, projects and development than those who have never taught. Mette hundahl (2007) expressed that it is clearly recommended that the maritime educational institutions should see to that the majority of lecturers have sea experience. A result of the investigations is that the senior officer qualified and experienced seaman is what the respondents want the maritime lecturer to be, especially those who teach nautical subjects. Among the respondent lecturers there is now only one third who has worked at sea as a senior officer, and every fourth did not work at sea at all. So the MET-institutions can improve by employing more senior officers and it will be a good target to increase the role of senior officers in the educational process. Optimum training method is a face to face discussion with the students with an aid of using the advanced training equipment. The instructor of simulator training system should have good knowledge in maritime fields and have good experiences in ship operation in order to create new and updated simulator training scenarios.

7. Conclusion

Technological improvement in shipping can be simulated as software or computer program by means of a PC or an advanced training method in order to improve learning experience. CBT is an interactive learning PC with minimum price which is being used for the orientation of trainees in emergency situations. As far as the quality of maritime management is concerned, the advanced assessment and training method is CBT simulator with qualified instructor under IMO guidelines or model courses. As the world is changing, therefore today's simulator instructor not only should be quite familiar with operating of the

simulator but also must be fully familiar with the advanced and navigational equipment such as DGPS receiver and integrated navigation systems. The quality of learning in simulator training is dependent on the qualification of instructor and not the computer hardware. Under new IMO Conventions, STCW95 requirements, and ISO series quality standards, it is essential to update and modernised our simulator techniques in order to provide better simulator training for future navigators. Simulators can be upgraded by using storyboard, MUD, CAL, MORAL training software as an extremely safe and effective method of training. While there is no question of permitting an intensity of standard, the process makes to reduce stress levels in students as a result of increasing their learning experience.

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